

COAL AGE

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Strong Position of the Coal Industry

MOST war industries are flooded with men and with plants. The coal industry has managed to avoid that unfortunate fate. It consequently needs little *readjustment*, if we may use that more correct word in place of the word *reconstruction*, which is familiar to us all but somewhat misleading and unfortunate.

True, the 5000 wagon mines, snowbirds, team-track mines, or whatever they may be called, will probably, as in the past, quit work in the summer and do a small business in the winter. But even though not as active hereafter as in the war, they will be more active than they were before it started, because the motor truck will greatly extend their radius of action. The men in them and employed by them will go back to the farms from which they were drawn.

The fate of these little mines with their meager investment is not important. What is of moment is the great outstanding fact that none of the track mines, which number 3600, need to go out of business. It might easily have been different had the Fuel Administration allowed without restriction the opening of new mines.

By its control the Fuel Administration was not seeking to protect the industry against the difficulties of the Readjustment Period. It had in mind solely the needs of the public during the war. New mines would have drawn off the men from old mines and would have set men to labor at work which would not have become productive during the war. It would have added to the number of mines when no more were needed. It would have consumed material for which the need elsewhere was great and would have hampered producing mines by transferring material from them to mines which were not producing, and might not produce during the war or even for some years thereafter.

The cry that new mines were needed was based on the fact that tonnage was not increasing as fast as desired. That would have been a valid

reason for more mines had the shortage of mines and not the shortage of men to work in them and the shortage of equipment to operate them been the determining factors. Thus the Fuel Administration's action has prevented work on an increase in mine capacity which would have hampered us in winning the war and made much harder the winning of the peace.

The past labor shortage will prove a godsend to the miners. It is well that the nation got its increase in tonnage, not from an increase in the mining population, but from an increase in the activity of those engaged in mining. Let the mine workers take a lesson from this. The best way to avoid a glut of labor in an industry is to supply the demand by a readiness to work a full eight-hour day, if not more, whenever the pressure on the industry becomes severe. Then when slackness comes the ranks of labor will not be filled to overflowing.

The strength of the coal industry during the war was due largely to an excess of mines and men. The nation profited by this ill adjustment between industry and commerce. When commerce, owing to the war, made big demands on industry it was amply ready to supply what was needed as soon as a little propaganda work among the miners had been done.

But during peace this ill adjustment is regrettable, and one which we do not desire to maintain against the possibility of the "next war," which we fervently hope will never come. The industry should try to keep its men working steadily day by day, excluding holidays, for as many hours a day as is customary in other industries. It will be readily admitted that any less regular operation reflects on present-day finance, though it must be granted that to correct the condition might not only be difficult but likely to confront us with problems compared with which a little irregularity of employment might seem to be a light affliction.

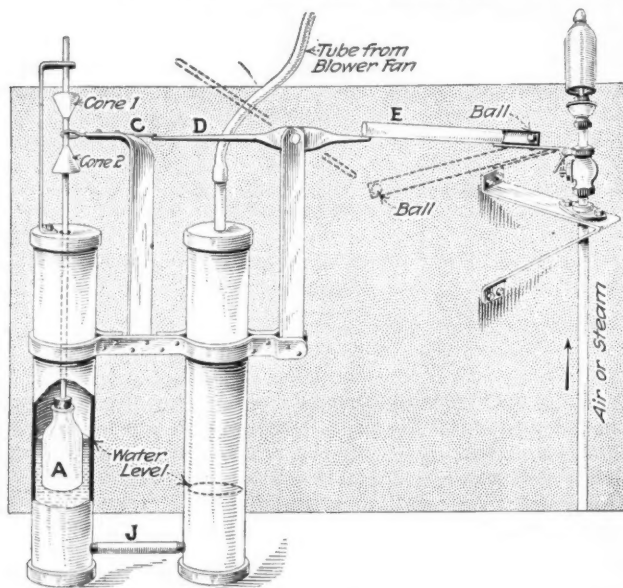
IDEAS AND SUGGESTIONS

Alarm To Show Fan Trouble

BY W. F. DECKER
La Salle, Ill.

The illustration below shows an alarm that has been installed at the Mathiessen & Hegeler Zinc Co.'s coal mine at La Salle, Ill. This device has proved satisfactory in every way, and the idea may be valuable to others whose conditions approximate those encountered at the La Salle operation.

In this particular installation the motor driving the



DETAILS OF ALARM TO WARN OF FAN TROUBLE

fan derives its current from a line that also serves several other motors. The common source of energy is the main power plant of the company. In consequence, if the main circuit breaker goes out the fan motor as well as the other motors stop. Before the installation of this mechanical telltale the stoppage of the fan might not have been perceived until the regular rounds were made or word was received from the shaft bottom.

As may be seen from the diagram, the apparatus is simple and can be built by almost anyone. Two containers of equal size, or nearly so, are placed side by side and connected together near the bottom by the pipe *J*. Both containers are partly filled with water. The top of one container is connected to the pressure side of the fan while the top of the other is open to the atmosphere. A large water gage is thus formed.

On the water in the open leg of the device is placed the float *A* (in this case a tightly corked bottle), which carries a small rod that passes upward through suitable guides. Upon this rod are placed two cones, one pointing up and the other down. Between these cones and encircling the rod is placed the trip slide *C*, which is so arranged that an excessive movement of the cones either up or down will cause the rod *C* to move to the left.

Such a movement of the rod *C* will trip the walking beam *D*, which will then rotate under the weight of the hollow lever *E*. The lever *E*, which is attached to the lever of the whistle, contains a steel or iron ball. When the tube is in normal position this ball rests against the end nearest the whistle. When the outer end of the lever is released from support and swings downward, the ball rolls to its outer end, thus bringing sufficient weight into action to blow the whistle, which is under 120 lb. air pressure.

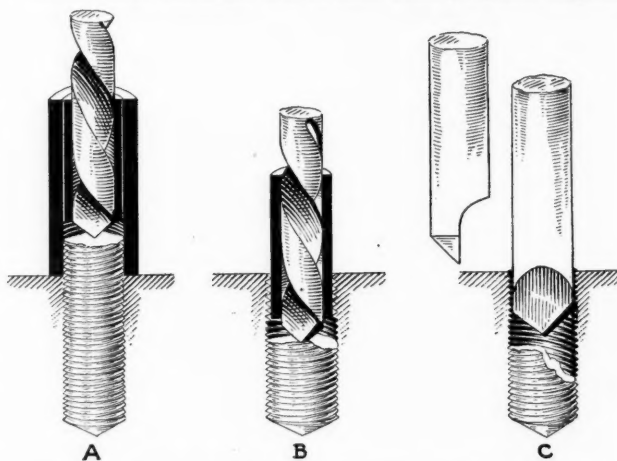
It will thus be apparent that so long as the fan runs at rated speed and the resistance of the mine is normal the surfaces of the water in the two containers will be at different heights, but practically steady, and the float *A* will support the cones at nearly a constant point. When for any reason, however, the fan stops or the resistance of the mine greatly decreases (as through short-circuiting of the air), the relative elevations of the water surfaces change. The float *A* will thus fall and the whistle will sound until the apparatus is reset.

Removing Broken Studs

BY ERNEST SCHWARTZ
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The extraction of a broken stud or cap screw is sometimes a difficult job. Many and varied have been the schemes adopted for this purpose. The accompanying illustration shows three similar methods that may be employed, as circumstances may dictate.

In the first instance the broken stud projects slightly



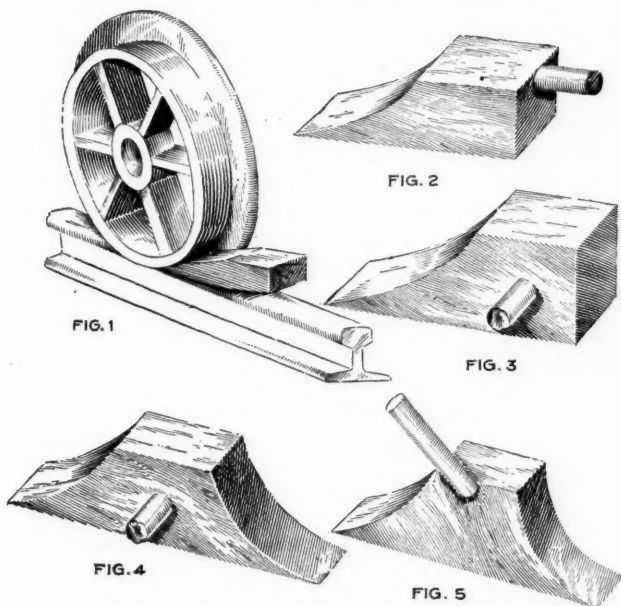
THREE METHODS OF REMOVING BROKEN STUDS

from the hole. In this case a tube the size of the stud is slipped over its end. This is provided with a bushing the internal diameter of which is the same size as the root of the stud threads. Through this bushing a drill of the same diameter is passed, the bushing acting as a guide. The stud may now be drilled out. If the stud is broken off within the hole, a bushing may be inserted directly as shown at *B*. This will

adequately protect the threads from the action of the drill. If a suitable bushing is not available, a special half-round drill of the same diameter as the tap drill may be made and used. The round portion will then bear against the threads without defacing them and thus guide the cutting end in its work.

Mine Car Chocks

There are three general methods of retarding the movement of a car or holding it stationary—braking, spragging and chocking. Brake mechanisms are usually, but not always, incorporated in the car by the manufacturer. Many forms and types have been de-



FIVE TYPES OF MINE CAR CHOCKS

veloped. Sprags are in many respects objectionable because of the severe stresses thrown by them upon the wheels, axles and running gear generally. They cannot be used with webbed wheels or those without spokes. Chocks do not stress the wheels and running gears nearly as strongly as do sprags; it is probable that their action is seldom if ever any more severe than that of brakes.

The chock shown in Fig. 1 is practically a hardwood wedge. It has the advantages of being cheaply and easily constructed and may be used upon either side of the car. It has the disadvantage of bringing the hand close to the rail, where it is more liable to injury than if kept farther away. Furthermore, in order to place this chock properly, the one who uses it must get partially in front or under the side of the car, provided the car is built with overhanging sides, as is often the case in mine cars. In any case, the man who places this chock must take a stooping, squatting or kneeling position in close proximity to the car.

Fig. 2 is an improvement on the chock shown in Fig. 1, in that a handle is provided, thus almost entirely avoiding the liability of crushed fingers. This block is much thicker and thus has greater chocking effect. The chock shown in Fig. 3 is similar to that shown in Fig. 2 except that the handle is placed on the side. This chock, as shown, will function properly upon one

side of the car only. Such chocks are often made and used in pairs. With a pair of them a car may be stopped from either side when moving in either direction. As a variation of this design a handle may be placed upon both sides. This makes the chock somewhat more clumsy to handle but renders it universal in application.

The chock shown in Fig. 4 is like that of Fig. 3 except that it is double-ended. One of these chocks may be applied from either side of a car moving in either direction.

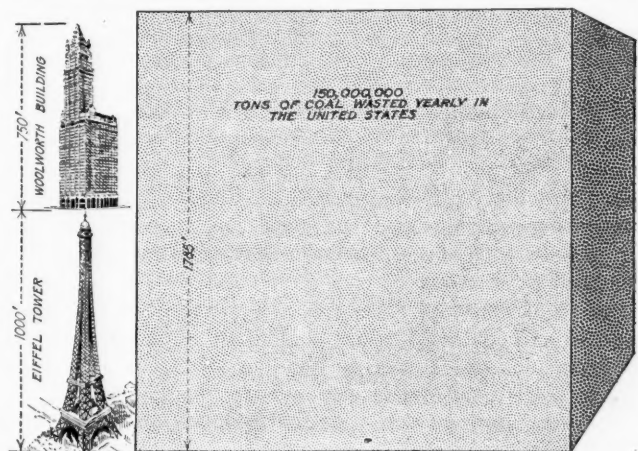
With all of the foregoing chocks a man must stoop or kneel in order to place them in position. The chock shown in Fig. 5 is like that shown in Fig. 4, and has the same universal application, with the added advantage of a long sloping handle. This chock may thus be applied from a standing position and is therefore much more conducive to safety.

How Big Is 150,000,000 Tons of Coal?

BY W. F. SCHAPHORST
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We have all been talking and writing glibly about the enormous amount of fuel wasted in the United States per year. Although this amount has been stated as 150,000,000 tons, nobody seems to be much impressed. In the hope that a visual quantity might have some effect, I sat down the other evening and "studied up" the average values and did some figuring. I learned that a short ton of bituminous coal occupies about 38 cu.ft. That being the case, it is a simple matter to multiply it by 150,000,000 tons, giving 5,700,000,000 cu.ft.

That looks like a big figure, but digits and ciphers in themselves don't express much unless we are familiar with their magnitude. Consequently, the best way to understand this figure is to extract the cube root. This



SHOWING PILE OF COAL WASTED YEARLY

gives 1785 ft. In other words, 150,000,000 tons of coal would make a 1785-ft. cube.

How much is 1785 ft.? The Eiffel tower in Paris is about 1000 ft. high. The Woolworth Building in New York is 750 ft. high. Put one on top of the other and you will "nearly" attain the height of this cube of waste coal. And remember that this wasted cube is just as wide and long as it is high. Isn't it a shame that we are wasting so much fuel?

Labor-Saving Methods and Appliances for Loading Coal

By G. W. ENGEL
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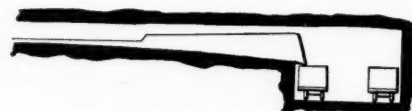
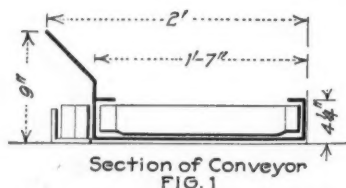
SYNOPSIS—A bibliography of the subject of machine loading in thin coal beds is here presented. Two types of machines appear to be particularly applicable. These and various methods of operation are discussed at some length, and interesting comparisons are made.

THE purpose of this article is to show the present state of the art of mechanical loading in a general way, together with running notes from various technical publications. Thirty-two references to existing literature on this subject are made, giving the name of the article, its author, the publication in which it appears, the date, the number of words and succinct notes and drawings of many devices, concluding with original matter concerning two types of loaders that seem destined to a wide application in coal mines—The V-scraper, or scoop, and the conveyor.

The period of research and original work runs from 1905 to the latter half of 1918. It is evident to every mining engineer that a successful mechanical loader

of Superintendent William D. Owens, with the help and coöperation of George P. Gallagher, H. H. Otto, Thomas O'Brien, John Ridgley, Pierce Robinson and certain other Lehigh Valley Coal Co. men. Harry McKean Conner, at the suggestion of Eli T. Conner, worked up a scheme in detail for mining thin coal beds, in the early part of 1915, after having seen the Valley scraper. This scraper and method of operation requires more or less hand shoveling in order to load it with coal. To eliminate this hand shoveling there has been developed a somewhat modified form of scraper and method of operation. Superintendent Cadwallader Evans, Jr., and certain men under his supervision, introduced a change in the construction of the V scraper and the method of working it. This modified form of operation consisted in the placing of extra posts with attached open pulleys at the corners of the chamber face, and a wood pulley set some distance back from the face. This permitted the scraper to be loaded by drawing it across the chamber face, eliminating the hand shoveling.

Some of the larger coal companies are now operating the V scraper, and several others contemplate using



FIGS. 1 TO 3. CROSS-SECTION AND SIDE VIEWS OF A LOW DRAG CONVEYOR

that will eliminate hand shoveling cannot but be beneficial through bringing under development great quantities of coal now unminable because occurring in thin beds. The matter is particularly important at this moment of ever-decreasing labor supply, because of war requirements, with corresponding imperative demands for increased production.

For thick coal beds there is now in successful operation in salt and coal mines a machine having a series of scoops or pans revolving about a shaft. The scoop digs into the coal and is elevated to a higher position, discharging its load onto a traveling conveyor which in turn delivers to the mine car.

For thin coal beds there are a number of appliances in more or less successful operation, such as buggies, conveyors, oscillating chutes, shallow cars or tubs, operated by wheel or drum and a wire rope; and V-shaped scrapers or scoops with open top and bottom, which are drawn along the bottom of the coal bed to the mine car. Some of these are covered by patents.

As to the V scraper and the conveyor, the latter has been in use many years both here and abroad. (See Arts. 6, 11, 26 and 33.) The V scraper (see Arts. 31, 32 and following paragraphs) was introduced in the anthracite region some four years ago under the direction

this equipment for the purpose of mining very thin coal beds.

Of the following articles, 32 represent the results of a research among the various technical publications of the world, and the others are the outcome of personal examination and original work.

1. Mechanical Coal Conveying at the Face.

Anonymous.

[Iron and Coal Trade Review.] Vol. 70, pp. 803-04, Mar. 17, 1905. 1800 w. Special reference to the Blackett coal conveyor at the works at Derwent Colliery, County Durham.

2. Mechanical Coal Conveying at the Face.

Anonymous.

[Colliery Guardian.] Vol. 89, p. 580, Apr. 7, 1905. 1300 w. Illustrated notes on the construction and management of an underground conveying system.

3. Working a Blackett Conveyor in the Working Face of a Thin Seam.

Badeley, H.

[Mines and Minerals.] Vol. 25, p. 607, July, 1905. Abstract of paper read before British National Association of Colliery Managers. The face is a right-handed one and has a dip of 1 to 16 against the loaded conveyor, which is 90 yd. long and built in 6-ft. sections. An 8-hp. electric motor drives the conveyor. Output increased from under 4 tons to over 10 tons per man. Seams not so advantageous to conveyors—undulating, tender roof, a roof very severe on

timber that would not allow the timber to be changed when shifting the conveyor over a bad lifting floor. From *Iron and Steel Trades Review*, Apr. 28, 1905.

4. The Mickley Conveyor.

Batey, J. W.

[Transactions, Institute of Mining Engineers.] Vol. 29, pp. 268-73, Apr. 8, 1905. (See par. 9.) The seam varies from 19 to 28 in. in thickness. Conveyor is a long shallow car, run by wheel and wire.

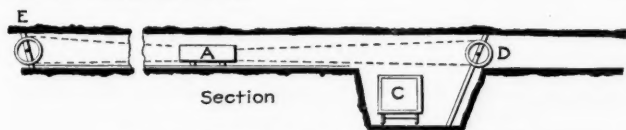


FIG. 4. MICKLEY CONVEYOR OR CAR

5. Use of Conveyors in Filling Coal Seams.

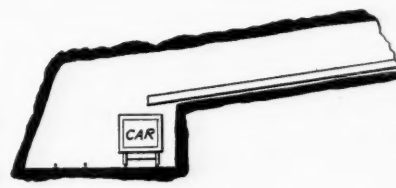
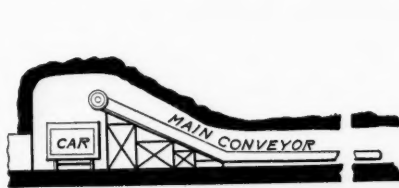
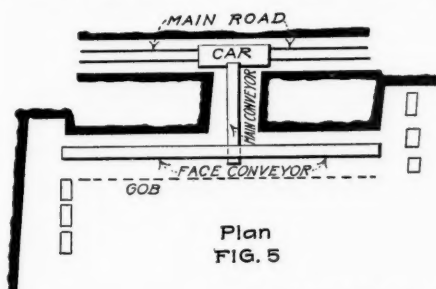
Blackett and Ware.

[Transactions, Institute of Mining Engineers.] Vol. 29, pp. 449-506, June 2, 1905.

6. The Greaves Coal Face Conveyor.

Anonymous.

[Colliery Guardian.] Vol. 92, pp. 1073-74, Dec. 7, 1906. 1100 w. Description, with four illustrations, of a conveyor of the scraper type. The important points are the low loading level, the small space in which the empty or non-conveying chain is returned, practicability of using it in seams thinner than 2 ft., and its compactness and simplicity. By reference to Fig. 1, showing a section of the conveyor, it will be seen that it is only 9 in. high by 2 ft. wide. It will also be noticed that the loading side is only 4½ in. high. The higher, or 9 in., side farthest from the coal face protects the return chain. This return being on the side of the conveyor instead of the bottom tends toward reduced height, and makes it practical to operate the device in thin beds. Figs. 2 and 3 show the conveyor arranged for operation, while the roof or floor respectively are cut away to form the main road. The bed is represented as being 2 ft. thick, with the main road 9 ft. wide and 6 ft. high, which will give a good idea of the relative amount of head-room required when cutting top or bottom rock to get



FIGS. 5 TO 7. ILLUSTRATING THE VINTONDALE CONVEYOR SYSTEM

Fig. 5—Plan of Vintondale conveyor system. Fig. 6—Cross-section of Vintondale workings, showing delivery end of conveyor. Fig. 7—Swinging or bumping conveyor operated on a pitch

height for the car. This conveyor, working as it does in confined spaces, with the necessity of constant shifting as the coal is worked out, can be moved quickly and expeditiously without disturbing any of the standing timber or props.

7. The Mechanical Pit-Car Loader.

Anonymous.

[Mines and Minerals.] Vol. 28, pp. 185-6, November, 1907. Conditions under which it should work. Method of operating and arrangements necessary to get best results. The mechanical pit car loader, chamber and pillar, Hamilton Manufacturing Co., Columbus, Ohio. The loader is moved from place to place by its own power. Practical in large seams only, say 7 ft. One end of the loader sweeps the face forward and back, the coal going up on one side of the conveyor on the forward movement, and on the other side on the return movement. The coal is elevated to a position between the roof and gate end of the car, and then falls into the car.

8. A Conveyor for Filling Coal at the Face.

André, L.

[Transactions, Institute of Mining Engineers.] Vol. 31, pp. 106-8, Apr. 7, 1906. Used in seam 30 to 36 in. thick. Trough, requiring an oscillating movement.

9. The Mickley Conveyor.

Batey, J. W.

[Engineering and Mining Journal.] Vol. 81, pp. 652-53, Apr. 7, 1906. British Patent (1904) No. 16576, Sidney Bates. The conveyor A, Fig. 4, is a long shallow tub, 7 ft. long by 2 ft. 8 in. wide by 11 in. deep (but 7 in. deep on side next to coal face). Bottom of conveyor has two sliding doors which are slid open and coal falls into the car. Conveyor is run by a ¾-in. galvanized wire rope, fastened to each end. The rope is turned 1½ times around the driving wheel D and has a single turn on the return wheel E. The driving wheel is worked by hand. Gage of conveyor road 2 ft. 10 in., and is laid on iron sleepers. Coal seam, 19 to 28 in. thick.

10. Conveyor System for Loading at the Coal Face.

Parsons, F. W.

[Engineering and Mining Journal.] Vol. 83, pp. 958-59, May 18, 1907. 1500 w. Certain thin and dirty seams can be worked profitably by this method when other systems would result in loss. Abstract of paper read before Institute of Mining Engineers of Great Britain. Describes the Vintondale system (see par. 11). The conveyor is of the pan type, 12 in. wide at the bottom, 18 in. at the top and 6 in. high. In the pan is run a malleable drag chain. This chain passes over a sprocket wheel at the head end (which does the driving) and returns over another sprocket at the read end. Both front and rear ends are inclined—at the front to obtain height enough to allow the cars to pass under, and at the rear to allow for the sprocket wheel. An air engine drives the conveyor.

11. Mechanical Conveyors as Applied to Longwall Mining.

Thomas, J. I.

[Mines and Minerals.] Vol. 28, pp. 200-203, November, 1907. 3500 w. Describes methods and apparatus used at Vintondale, Penn., by the Vinton Colliery Company. Triple and single conveyor system. The article gives a detailed description of the inside plans and arrangement. The coal

worked is the Lower Kittanning seam, 42 in. thick, 8 per cent. pitch and 200 ft. of cover.

12. Maschinelle Fördereinrichtungen vor ort auf Rheinisch-Westfälischen Gruden.

Herr Forstmann.

[Glückauf.] Vol. 44, pp. 1281-90, Sept. 5, 1908. 500 w. Describes the conveying devices used in several of the mines of this district.

13. Underground Conveyors at the Kleinfontein Mine.

Way, E. J.

[Engineering and Mining Journal.] Vol. 86, pp. 715-16, Oct. 10, 1908. Trough conveyor. "Swing Conveyors at the Kleinfontein Mine, Transvaal-Rand District," by Edward J. May, Consulting Engineer, Hotel Savoy, London, England. Power drive impossible on account of the cost and mechanical difficulties due to conditions, so hand power by men pulling on upper end was used. Ore mine, pitch 26 deg. Conveyor 18 in. wide, 32 ft. to 224 ft. long, in 8-ft.

lengths; built of $\frac{1}{2}$ -in. iron and suspended from chains from the hanging wall. Time, 45 minutes to take down and put up again one 224-ft. conveyor. Number of holes for chains 29. Seventy conveyors are used, saving 420 men. Proposed to work out a monorail system which consists of a single rail suspended from the roof.

14. Swinging Chutes for Coal Mines.

Anonymous.

[Engineering and Mining Journal.] Vol. 87, pp. 362-63, Feb. 13, 1909. Swinging trough system. Dimensioned drawings; comparative costs. Swinging or oscillating

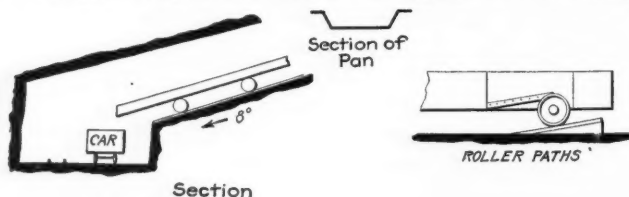


FIG. 8. SHAKING CONVEYOR HUNG ON ROLLERS

chutes for coal mines. By Lestelle & Hyve, engineers for the Compagnies des Mines de l'Escarpe. Abstract from Bulletin de la Société de l'Industrie Minière, March, 1908. The system consists essentially of an iron trough suspended in such a way as to be free to swing, and subjected at the end of each swing to a jar which sends the coal forward and finally discharges it into a car standing in the entry. The swinging motion is given to the trough by a double lever, so bent as to be easily reached by the loader at the car. The jar at the end of each swing is given by a buffer fastened to the bottom of the lower end of the chute. The buffer and lever are adjustable. Pitch of coal seam 15 to 20 deg. No thickness of seam given. Chute from 20 to 100 ft. long.

15. Mining Coal with Machines in England.

Dixon, G. R.

[Engineering and Mining Journal.] Vol. 87, pp. 797-800, Apr. 17, 1909. Conveyor for handling coal in mine. Coal, 3 ft. 6 in. Coal is undercut by disk machine. No details as to the conveyor or undercutting machine. The article deals mainly with costs, arrangement of roads and plan of attacking the face on the longwall system. Detailed costs show that economy in mining results more from increasing value of coal produced (larger sizes) than from reduced working costs.

16. The Use of Coal-Cutting Machinery.

Rowland, R. H.

[Engineering and Mining Journal.] Vol. 90, pp. 1067-70, Nov. 26, 1910. Also notes on operation of conveyor used in longwall system; 12 to 150 ft. faces and two conveyors. Coal 3 ft. thick. Coal all cut by hand. Conclusion that conveyors in conjunction with reliable coal cutters should be a great improvement on the old method. Plans show the two 150-ft. faces and system of timbering.

17. A Coal Loading Machine.

Whaley, William.

[Mines and Minerals.] Vol. 31, pp. 206-08, November, 1910. 1500 w. Illustrated description of apparatus for use in mines to load coal cars. Developed by engineering firm of Meyers & Whaley, Knoxville, Tenn. Used by the United States Coal and Oil Company, Holden, W. Va. Seam $6\frac{1}{2}$ ft. Rooms 36 ft. wide. Average coal loaded per day, 128 tons—six-day test; lowest, 90 tons (not enough coal); highest, 150 tons per day. Four men required to operate the machine—1 machine runner, 1 man in front and 2 men to handle cars and pick slate. Four rooms loaded out per day. The article gives plan and elevation of machine, also mine plan (7 rooms) and working face drawing. Machine built on the scoop shovel plan, the scoop going under the coal and throwing it back to a conveyor which in turn conveys the coal to the car.

18. Coal Face Conveyors.

Booth, A. E.

[Colliery Guardian.] Vol. 101, pp. 474-76, Mar. 10, 1911.

4000 w. Gives a general description of various types of and experience with the Blakett conveyor in thin-seam working.

19. Coal Face Conveyor.

Ridsdale, H. H.

[Iron and Coal Trade Review.] Vol. 83, pp. 1012-13, Dec. 22, 1911. 4000 w. Discusses the economical working of thin seams, describing types of conveyors and their use.

20. The Adair Face Conveyor.

Anonymous.

[Colliery Guardian.] Vol. 104, pp. 1011-12, Nov. 22, 1912. 2000 w. Drawing and description of a coal face conveyor designed to occupy as little space as possible in the vertical direction when discharging.

21. Moving Minerals in Thin Flat Beds.

Anonymous.

[Mines and Minerals.] Vol. 33, pp. 310-12, January, 1913. Swing chutes, scraper conveyors and shaking conveyors for transporting minerals underground. Page 310 shows a swinging chute suspended from the roof by chains. Ore is shoveled into the upper end and moved down by swinging the chute. Mention is made of the Vinton Colliery Co. conveyor. (See Art. 11.)

22. Machine Mining in Anthracite Mines.

Archibald, Hugh.

[Colliery Engineer.] Vol. 33, 471-76, April, 1913. 4000 w. Illustrates and describes methods of cutting and handling the coal that renders it possible to work thin seams profitably. Page 476 makes mention of the Delaware, Lackawanna & Western conveyor at the Dodge mine, by the panel longwall system. Rooms 24 to 40 ft. wide in 4-ft. seam. Coal goes by conveyor to small car on counter, thence by the counter and small car to the mine car on the gangway. Goodman, Sullivan and Jeffrey shortwall undercutting machines have been used; over 200 cars are produced per keg of powder. Five feet of bottom rock is taken up in gangway to give height for the car and topping. Top

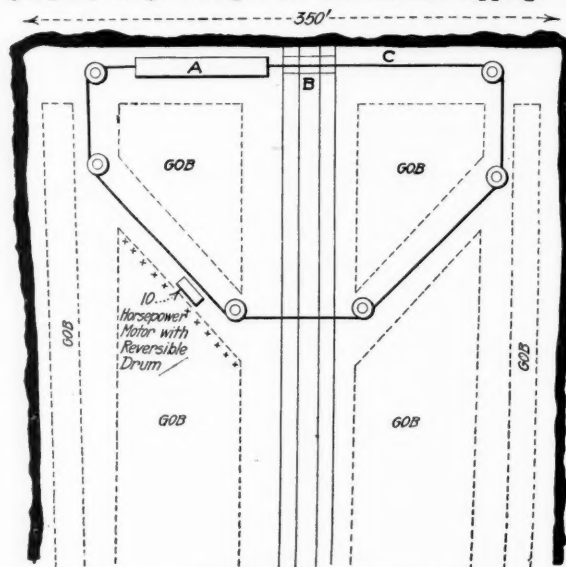


FIG. 9. A TRAVELING PAN CONVEYOR

of conveyor 12 in. from floor. Flat broad linked chain moves on the bottom of the conveyor trough, taking the coal over the sprocket wheel at the discharge end and travels back on angle iron guides under the trough. The driving motor and conveyor are built together.

23. Underground Conveying.

Mayor, Samuel.

[Colliery Guardian.] Vol. 105, pp. 1113-15, May 30, 1913. Serial, first part. Face conveying.

24. Nelson's Patent Longwall Coal Conveyor.

Futers, T. C.

[Colliery Guardian.] Vol. 105, p. 1013, May 16, 1913.

25. Mining with a Conveyor System.

Brown, J. F. K.

[Coal Age.] Vol. 8, pp. 204-07, Aug. 7, 1915. 4500 w. Mining safer; output increased; costs lowered. Conveyor has been in use for ten years. Vein 3 ft. 9 in. and coal 2 ft. 7 in. Dip 8 deg. Shaking conveyor is employed. The conveyor in use is of the old shaking type, and has been adapted from continental practice. The height from the floor to the edge of the pan is only 9 in. The width is 18 in. and the length 300 ft. The conveyor rocks back and forth on rollers, in specially arranged paths. These are so designed as to cause the machine to fall sharply at the end of the forward stroke, whereby the motion imparted to the coal is continued in the material itself, while the conveyor draws back for the next stroke—60 strokes per minute. The length is very important, varying as the grade. The theory is that of a shaking screen. Movable sides can be taken out and placed across the conveyor for the divergence of waste at any convenient point. The conveyor pan is in 6-ft. sections. The engine is driven by compressed air; 12 hp.; stroke, 5 in.; diameter of cylinder, 7 in.; weight of engine, 572 lb. Connection to the conveyor is through a lever action and rigid attachment, the cylinder at right angles to the line of the conveyor. (See Fig. 8.)

26. Longwall Conveyor and Loader for Thin Seams.

Dickson, James.

[Coal Age.] Vol. 7, pp. 368-9, Feb. 27, 1915. 1500 w. Describes a sectional conveyor and loader that is moved forward following the face. The cost of production has been reduced. A (Fig. 9) is conveyor with 6-ft. sections made of $\frac{3}{4}$ -in. plate. Each section is 3 ft. wide and 9 in. high on gob side and open on the coal side. It is mounted on T-iron. B is a trestle under which the cars stand for loading. C is a rope for operating the conveyor. In actual operation the conveyor was drawn up until one end was close to the wheel on the end road, and the miners on that section were given 3 min. in which to load their coal, each section of conveyor holding 300 to 500 lb., so that with 20 sections there will be three to four tons on the conveyor. When ready to move, the man in charge signals the motorman to go ahead. The roof support was augmented by two rows of hardwood cogs between the conveyor and the gob, and built on loose dirt to facilitate their removal for use again.

27. American Coal Mine Haulage.

Anonymous.

[Colliery Guardian.] Vol. 112, pp. 61 to 63, July 14, 1916. 4500 w. Conditions and haulage systems, especially wire rope haulage.

28. Progress in Underground Ore Loading.

Richards, M. E.

[Canadian Mining Journal.] Vol. 37, pp. 344-46, July 15, 1916. 200 w. Types of loading machines.

29. Coal Face Conveyors Employed in the United Kingdom.

Walker, S. F.

[Coal Age.] Vol. 10, pp. 744-8, Nov. 4, 1916; pp. 790-4, Nov. 11, 1916. Exhaustion of the thicker coal beds in Britain has rendered the working of thinner measures highly desirable. To meet this condition the coal face conveyor has been developed. Two types of conveyor are described in this article.

30. Use of Face Conveyors.

Brown, J. F. K.

[Coal Age.] Vol. 11, p. 761, Apr. 28, 1917. Letter No. 1, from J. F. K. Brown, Montreal, Can. Reply to letter of Jim Golden and his nonsuccess with a face conveyor (Coal Age, Mar. 10, 1917, p. 445). Brown says that in one district alone on the continent of Europe, 40,000 ft. of conveyors are in operation under varying conditions of coal seams. He uses the Blackett conveyor. There are over 10 different types of conveyors, he says. In one case, to his knowledge, there were eight conveyor faces, each 300 ft. in length, seam 2 ft. 6 in. thick and 10 deg. pitch.

31. Scraper Mining for Low Veins.

[Employees' Magazine of the Lehigh Valley Coal Co.]

April, 1916, p. 67. About 1350 words with three illustrations. This article tells about an economical method of mining thin flat seams of anthracite coal, devised by the Lackawanna Division of the Lehigh Valley Coal Co. "The mining of thin flat veins in the anthracite coal region has always been costly on account of the large amount of rock that must be mined with the coal. The time, money and energy spent on mining this dead rock and then piling it on huge rock banks on the surface is wasted. This same difficulty is met with in the coal regions the world over."

* * * "Various systems have been tried and advocated, such as small buggies, chutes and low extensible conveyors, but a few months' or a half year's trial would reveal one

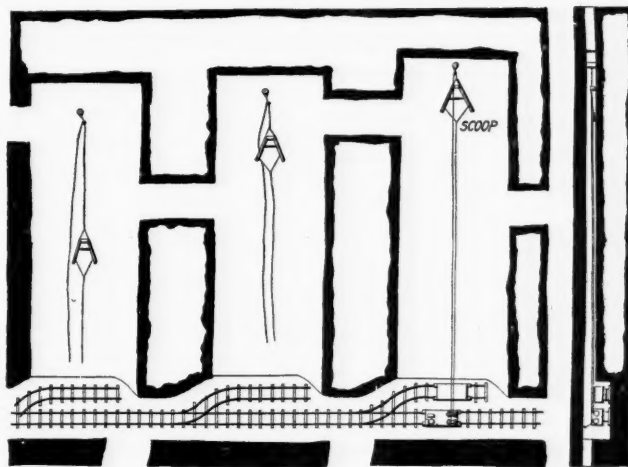


FIG. 10. PLAN AND SECTION SHOWING HOW SCOOP IS USED

weakness after another until they were proved impracticable."

A scoop for low veins has been built consisting of two legs of $\frac{3}{4}$ -in. sheet iron, about 4 $\frac{1}{2}$ ft. long, properly shaped and fastened with heavy iron hinges to a small square back sheet about a foot wide. The two legs of the scraper swing open and close like the wings of a bird. To prevent the legs from opening too wide, a $\frac{3}{4}$ -in. chain about 8 ft. long is bolted to the ends of the wings. At the center of this chain is attached a $\frac{3}{4}$ -in. steel wire haulage rope, which drags along the whole device. A haulage rope is also attached to the back, so that the scraper can be pulled backward as well as forward. The scraper holds about 800 lb., and five scraperfuls will fill a mine car.

Operation—An eyebolt and pulley are driven in the roof, near the face of the chamber, and two pulleys fastened at the foot of the chamber, but close to the gangway rib. Of the last two pulleys one is used to guide the rope which pulls the scraper back up the chamber while the other guides the rope pulling the scraper and its load into the mine car standing on the gangway at the foot of the chamber. Opposite each chamber a double track must be provided, one for the mine car and one for a double drum electric haulage engine. A specially designed electric haulage locomotive with horizontal drums for dragging the scraper back and forth in the chambers has been employed. Fig. 10 is a plan and section showing how the scraper or scoop is used. The system of mining is the room-and-pillar, with rooms or chambers 24 ft. wide and 50 ft. from center to center of rooms. Of course, no rock is mined in the chambers, the only rock taken up is on the gangways. The coal is hand drilled and then shot off the solid.

32. Scraper Mining of Thin Bed Anthracite.

Humphrey, E. P.

[Coal Age.] P. 316, Aug. 15, 1918. About 6 columns, or 2750 words, with illustrations. Describes the scraper method and appliances for loading coal from a bed less than 3 ft. thick and pitching less than 20 deg. First introduced by the Lehigh Valley Coal Co. about four years before. The scraper is triangular in shape, open at the

top and bottom; 48 in. wide at the base and 14 in. high, made of No. 10 sheet steel, and when filled holds 8 cu.ft. of coal. It is either hinged at the apex or made solid in construction, depending upon whether the floor is irregular or smooth. The loaded scraper travels about 145 ft. per minute, and is filled at the chamber face by a man with a low lift shovel. The hoist used to drag the scraper up and down the chamber is a double drum machine, equipped with a 5-hp. motor and weighs 1650 lb. The drum has a capacity of 900 ft. of $\frac{3}{8}$ in. wire rope used both for main and tail. This hoist is placed in an opening 5 ft. deep and 4 ft. high by 6 ft. long, on the opposite side of the gangway from the chamber. A new move and set-up of the hoist must be made for every chamber. At the face of the chamber the rope passes around a snatch block, which is secured to an adjustable screw jack with pointed ends. This jack is moved across the chamber as the scraping proceeds. Clearance for the car on the gangway is made by blasting up the bottom rock so that the top of the car is about on a level with the bottom of the coal in the chamber. This permits the scraper to discharge its contents directly into the car. The cars hold either 92 or 45 cu.ft. The gangway is 9 ft. wide and 4 ft. high on the low side. The chambers are from 24 to 50 ft. wide and vary in length from 100 to 360 ft.—200 ft. being the best practical length. The best loading record is 32 small cars per shift of 8 hours, with a night shift of two men and a day shift of four men, all doing "company work."

From the preceding references and quotations there stand out preëminently two types of machine for the getting of coal from the longwall or chamber face into the mine car—the conveyor with continuous carrying chain driven by gear wheel and pinion, discharging its contents into the car on the gangway road (see Arts. 6, 11 and 26) and the open top and bottom V scoop or scraper, drawn back and forth on the bottom of the coal bed by a wire rope, its contents dropped intermittently into the car on the successive forward moves, the empty scraper returning on the backward movement for a new load.

From present mining in Luzerne and Lackawanna counties there can be made a comparative study of the relative merits and performances of each of these two labor-saving machines, reduced to unit production of cars, tons or cubic feet per men per day.

Mine A employs the first, or conveyor, type of loader. The coal bed pitches from 2 to 5 deg., is from 18 to 27 in. thick, and is overlaid with hard sandstone and underlain with a somewhat softer rock, which is blasted and removed on the gangways so as to get sufficient height for the car. The depth of the seam is about 150 ft. This will become 450 ft. as a maximum as the mining proceeds from the outcrop. The system of mining (see Fig. 11) is longwall advancing, except that from road 2, which is by chamber and pillar. The faces of the chambers off of road 2 are near the outcrop, and the pillars of coal are left to prevent the inflow of water which would take place if there were surface subsidence.

Two lines of pillars of coal are left to protect the main haulage roads in the longwall mining. (See roads 3, 3A, 4 and 4A.) The 150 x 250 ft. or upper panel between roads 3 and 2A has been mined and coggied. Road 3B is 7 ft. high and 12 ft. wide. Of this 7 ft. about 5 ft. of rock had to be blasted and removed from the bottom, thus permitting the top of the mine car to be a little lower than the bottom of the coal bed, allowing for a topping of 3 in. The cars standing on road 3B received the coal from the conveyor. The coal was

drilled with jackhammers and shot off the solid. In this section the coal bed runs from 18 to 24 in. thick, so that it was impractical to use an undercutting machine. This required excessive blasting, which broke up the coal and kept the conveyor a considerable distance from the longwall face, reducing the prepared sizes and causing more labor through necessitating shoveling a considerable distance into the conveyor.

A slight increase in the thickness of the coal in the two lower panels between roads 4 and 3A makes it possible to use an undercutting chain machine. The seam here is about 27 in. thick, with a 6-in. band of bone and slate in the bottom. In this the undercut is made. Road 4B is 7 ft. high by 12 ft. wide. The mine cars are placed and loaded on this road. The two lower panels are each 150 x 150 ft., both being mined from the one road 4B. As the mining proceeds cogs are placed at about 25-ft. intervals. Of these two lower panels the left one is now being worked.

The number of men required to operate the upper

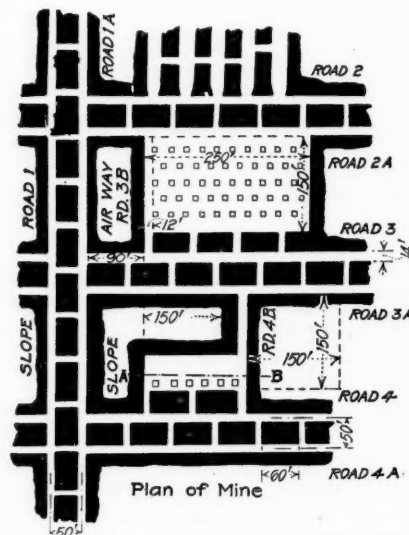


FIG. 11. TYPE OF MINING WHERE CONVEYOR IS EMPLOYED

panel was as follows: One man in charge, 4 men drilling and blasting, 4 men shoveling coal into the conveyor, 1 man operating the conveyor motor and leveling the coal in the mine car on road 3B, making a total of 10 men. The number of men now operating the left-hand lower panel is as follows: One man in charge, 1 man operating the undercutting machine (machine runner), 1 helper (machine runner's helper), 5 men shoveling the coal into the conveyor, 1 man operating the conveyor motor and leveling the coal in the mine car on road 4B, 1 man drilling and blasting, a total of 10 men. Thus, it is noticed that there is required one man less for breaking down the coal in the lower panel than in the upper one, with a corresponding increase of one man for shoveling in the lower panel.

About two-thirds of the cog timber has been used before and comes from another coal bed where the mining of pillars is now in progress. There is little if any refuse in the seam, and material for pack walls or cogs must come from outside the mine.

The longwall chain conveyor, Fig. 13, is 12½ in. high by 20½ in. wide, the head end being 13 ft. long and 2 ft. high at the motor. It is driven by a 10-hp. direct-cur-

rent motor, operating at 950 r.p.m. The undercutting machine is of the ordinary chain type, 23½ in. high. Fig. 12 is a section of the seam showing the conveyor, the gangway and the car, the opening in the seam being 27 in. high.

The production per man per day of eight hours follows. This does not include the opening of road 4B or the mining of the first cut along section line A-B,



Section A-B
FIG. 12



Section of
Conveyor
FIG. 13

FIGS. 12 AND 13. SECTION OF COAL BED, SHOWING CONVEYOR AND GANGWAY

preparatory to the start of the undercutting machine and the placing of the conveyor.

In the month of August, 10 men, working 20 days each, produced 284 cars. The capacity of each car is

85.50 cu.ft., so that $\frac{284 \times 85.50}{10 \times 20} = 121.41$ cu.ft. per

man per day, and $\frac{284}{200} = 1.42$, or the number of cars produced per man per day; 39½ cu.ft. of loose coal will produce 1 ton of prepared coal. Whence $\frac{121.41}{39.50} = 3.07$ tons of prepared coal per man per day.

Mine B, or the second illustration, uses the V scraper, mentioned in the introduction and shown in various figures. It is, however, a modification of the Valley scraper mentioned in Arts. 31 and 32. The seam varies in thickness from 18 to 36 in. and has an average thickness of 27 in. Jackhamer drills are used and the coal is shot off the solid. The system of mining is pillar and chamber. The chambers are driven on 50-ft. centers and are 30 ft. wide. A 7½-ton double-drum electric hoist is located in a crosscut between the heading and airway. (See A, Fig. 14.) From this location of the hoist five chambers are operated, two on the right, two on the left and one directly opposite. Two wire ropes, forming a loop, within which is the V scraper, pass over four 8 in. diameter pulleys in front of the hoist. Thence the rope goes along the gangway to two pulleys in front of the chamber at B and up the chamber. These pulleys are close to the rib and overhead.

The scraper, Fig. 16, holds about 12 cu.ft., and four scraperfuls will load a mine car. There is an iron brace at the front or wide end and a flange 3 in wide on the bottom of the scraper, tapered at the front to keep it from riding over the loose coal. Fig. 15 is a plan of part of a chamber face, while A, B and C are open pulleys, 6 in. in diameter, fastened to adjustable jacks, which are secured in the top and the bottom of the seam or opening. A passageway for the scraper is formed between the left rib and boards nailed to the bottom of a row of props some distance out in the chamber, as shown in the diagram.

Suppose that the scraper has just returned empty, and is in the position shown by the dotted line. It continues its movement toward B, and when close to B is stopped. Then the rope is placed in the open pulley C, and the scraper pulled toward this point, gathering its load as it goes along. When close to C the rope is thrown off and the scraper is now in a position to pass and proceed down the chamber with its load. In

order to scrape out the coal nearer the face, the open pulley at A is used. The method of operation between B and A is the same as that just described between B and C. Three men are necessary at the chamber face. By the proper manipulation of the jacks, the drum, the open pulleys and the rope, the coal can be scraped out of the chamber and shoveling eliminated, which, as must be agreed, is hard and laborious work in a thin coal seam.

The number of men required for the operation of the scraper is as follows: One man at A and C, Fig. 15; one man at B, Fig. 15; one man at the drum, called the scraper boss; one man on the gangway leveling the coal in the car; one man operating the electric hoist; four men drilling and blasting; total, nine men.

Covering the mining operations for one month, the average number of cars per man per day was 2.08. The capacity of the mine car is 42.61 cu.ft. Hence

$$\begin{aligned} \text{Cu.ft. per man per day} &= 2.08 \times 42.61 = 88.63. \\ \text{Cars per man per day} &= 2.08, \text{ as stated above.} \\ \text{Tons per man per day} &= 88.63 \text{ divided by } 3.95 = 2.24. \end{aligned}$$

The number of cubic feet of loose coal per ton of prepared coal is the same as in Mine A.

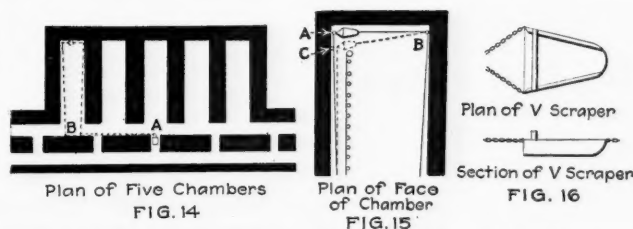
In *Coal Age* of Aug. 15, 1918, p. 316, E. P. Humphrey states that the maximum production was 32 small cars per shift of 8 hours, with a force of 6 men, or 5½ cars per man per day. However, Mr. Humphrey informs me that a fair average production per man per day would be three cars of 45 cu.ft. capacity each, in a bed 36 in. thick, worked by pillar and chamber, with the coal hand-mined or shot off the solid. This would give the following results for the Lehigh Valley Coal Co.:

$$\begin{aligned} \text{Cubic feet per man per day} &= 3 \times 45 = 135; \\ \text{Cars per man per day} &= 3, \text{ as above stated;} \\ \text{Tons per man per day} &= 135 \text{ divided by } 39.5 = 3.42. \end{aligned}$$

Comparisons may now be made with Mine A and Mine B, as follows:

	Mine A	Mine B
Cubic feet per man per day.....	121.41	88.63
Cars per man per day.....	1.42	2.08
Tons per man per day.....	3.07	2.24

Actual experience in Mine A proved that in the lower longwall panel, with an undercutting machine, the coal production was nearly double that in the upper panel, where the coal was mined by hand. Thus if the Valley mine and Mine B should use the undercutting machine,



FIGS. 14 TO 16, SHOWING V-SCRAPER AND ITS OPERATION

they would nearly double production and a comparative table would show:

Name of Mine	No. of Men	Thickness of Seam	Production per Man per Day	System of Mining
Valley	6	36 in.	270.00 Cu. Ft.	Pillar and chamber
Mine A	10	27 in.	121.41 Cu. Ft.	Longwall advancing
Mine B	9	27 in.	177.26 Cu. Ft.	Pillar and chamber

Longwall mining should also increase the production of Mine B and the Valley mine. However, for a fair comparative estimate it will be noticed that the Valley mine has the thickest coal bed, and only a few inches

more or less, when considering thin coal seams, sometimes makes all the difference between profitable or prohibitive mining. Also, in Mine B, the coal is far superior in quality, parting easily from roof and floor, being crisp, bright and sparkling; the table above is thus valuable as showing the advantages of using machine mining to increase output. Hence, a fair comparative table would show:

Name of Mine	No. of Men	Thickness of Seam	Production Cu.Ft.	per Car	Man per Day	System of Mining
Valley	6	36 in.	135.00	3.00	3.42	Pillar and chamber
Mine A	10	27 in.	121.41	1.42	3.07	Longwall advancing
Mine B	9	27 in.	88.63	2.08	2.24	Pillar and chamber

On the basis of cost, having regard only to the number of men required, the order of excellency would be: First, Valley mine; second, Mine B, and third, Mine A. Thus, it can be seen that the V scraper reduces the labor necessary in mining—the Valley mine requires four men less, and Mine B one man less. As to production, of course, merit should be given, first, to the Valley mine, with 3.42 tons; second, to Mine A, with 3.07 tons; third, to Mine B, with 2.24 tons per man per day.

Signaling in British Coal Mines Under the New Act

BY SYDNEY F. WALKER

Alexandria Park, Bath, England

A New Coal Mines Regulation Act was passed by the British Parliament in 1911, and subsequently special rules have been issued (in 1912 and 1913), some of which have an important bearing upon the matter of signaling. With shaft signals, for instance, a new requirement is made. Under the old rules a sound signal that could be heard by both engine man and top cager was sufficient. Under the new rules a visual signal must also be given. This must be placed in such a position that the engine man can always see it without turning his head, and the last signal must remain visible until the engineer has completed the order implied by the signal.

Where men are carried on the cage a difficulty in complying with this regulation arises. Under both old and new rules, one rap always means that the hoist man is to commence the wind. When men were to come up, a special signal was made under the old rules; three raps in some districts, four in others. It has always been forbidden to carry anything in one cage, except men, when men were riding in the other. Thus the top cager had always to give permission for men to come up by replying to the bottom cager's signal. Men were then allowed to go on the cage.

It was often difficult to obtain a top cager's permission to send men up during the ordinary working hours, because it meant the loss of two complete hoists of coal. When men were coming up, under the old rules the bottom man signaled to the top cager and to the engineer by one operation, then waited until the top cager returned the signal. When men were to be allowed to come up, the top cager so signaled to the bottom man and to the engineer. The men then got onto the cage at the bottom, and the usual signal to commence the hoist was given. Under the new rules the engine man must have something before him, from the time the men are signaled to come up until he commences the hoist.

Under the old rules there were two kinds of signal employed, mechanical and electrical. With both there was a bell in the hoist house that was struck from one to four times, according to the signal to be given. With some forms of mechanical signal there was a dial, over which a hand moved, the number to which it pointed corresponding to the number of raps given. Thus when 3 was signaled for men, the hand first moved over the dial to that figure, and when the signal was given to commence to wind, it moved on to the figure 4. Under the new rules this arrangement is not sufficient; if 3 means men riding, 3 must remain in sight of the hoist man, undisturbed by subsequent signals, until the hoist commences.

With the electric method of signaling, which was not employed at many mines, there was no visual signal at all. There was usually a bell on the tibble, as well as one in the engine house, and both rang simultaneously when the bottom cager signaled, the required number of strokes being sounded on both bells at the same time.

Two methods have been proposed and, I understand, adopted to a certain extent, to overcome the foregoing difficulties. The chief obstacle to be surmounted is that the signals must not be cumulative. The signal announcing men must not be interfered with. In one system of electric signals the visual sign has been obtained by copying the mechanical dial, the iron core of a solenoid electro magnet taking the place of the pull wire, the hand or pointer being moved round the dial by a ratchet and pawl.

To meet the new requirements there are two concentric dials and two ratchets. The pointer sweeps over the inner dial and a flag, carrying the word "Men," is carried round by the second ratchet and appears behind the clear glass space corresponding to 3 or 4 gongs. The outer dial is merely employed for calling the hoist man's attention to special signals. The pointer and flag work independently of each other, the flag being set in motion only when men are to be carried. At the pit bottom there are two pushes, or contact makers; one is used for giving the signal on the bell and for moving the pointer over the dial; the other is used only when men are to come up.

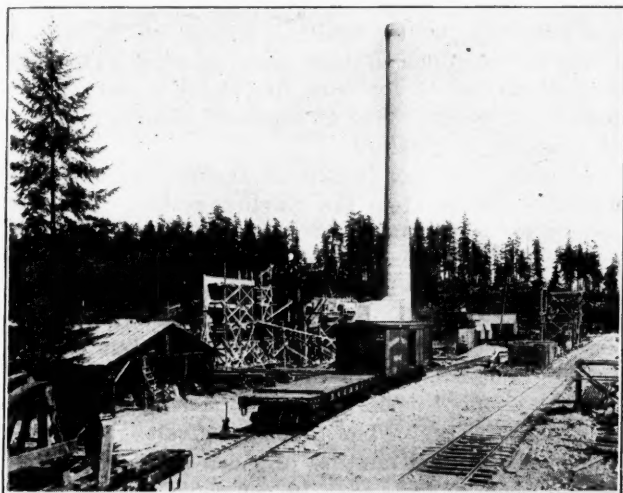
The firm that is introducing this apparatus has also worked out a mechanical signal on similar lines. It has two dials, a pointer and the flag with "Men" upon it appearing behind the clear glass space. The bell, however, is worked by one pull wire and the flag mechanism by another.

In the other apparatus that has been developed electricity is employed exclusively, and the arrangement is practically an extension to mining work of the indicator system employed in houses, hotels, etc. The indicators consist of panels of glass, behind which incandescent electric lamps are lighted when a signal is given. A screen appears at the same time, on which the signal transmitted is shown in clear lettering. In the engine house there is a panel indicator, having one panel for each signal that can be given, or alternatively, a limited number of panels, portions of each panel corresponding to each signal. There are two bells in the engine house: one may be rung from the tibble, and the other from the pit bottom. The electric lamps are energized either from a small battery of accumulators, a battery of

(Concluded on page 985)

New Mine at Cassidy's, British Columbia

When the Granby Consolidated Mining and Smelting Co. acquired coal rights at Cassidy's, Vancouver Island, B. C., a short distance south of the City of Nanaimo, it was stated that it would have a producing mine in operation within a year. There was some speculation at the time as to whether, in view of the general shortage of labor and the difficulty, comparatively speaking, of obtaining machinery, it would be possible to accomplish this. The question now is settled. The company has reached the goal set. Its new colliery is in operation, a thoroughly modern plant having been installed, through which there passes every month an average of 2700

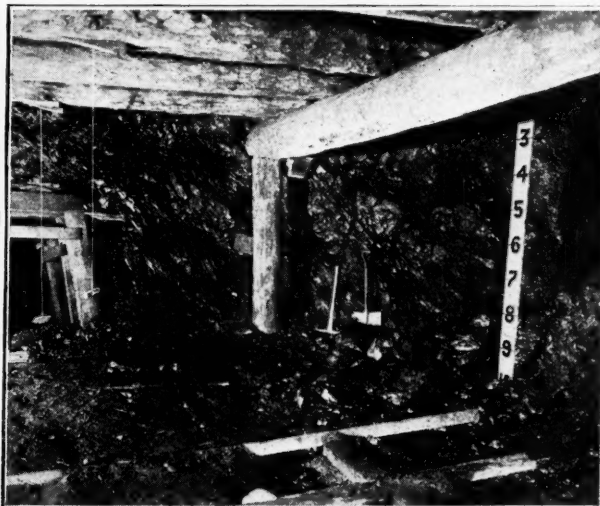
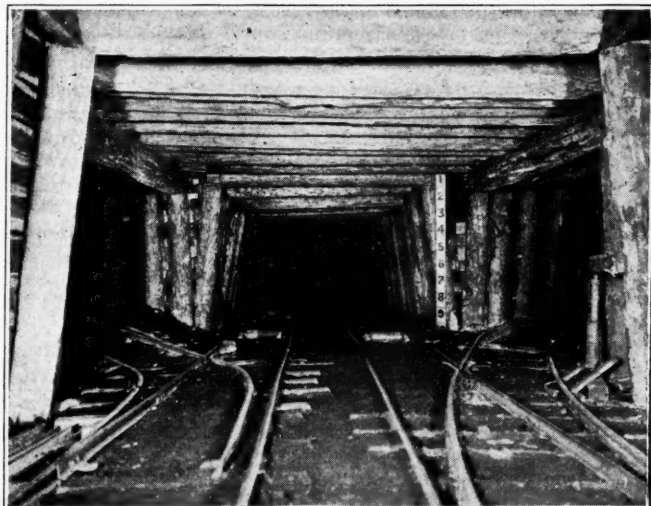


POWER HOUSE AND TEMPORARY TIPPLE OF NEW MINE IS SHOWN ON LEFT. THE RIGHT VIEW SHOWS THE 12-FT. OUTCROP OF THE DOUGLAS SEAM

tons. That this production will be increased materially in a short time there is no doubt, as development work is being advanced with a view to putting the mine in the front rank among those of the Island in regard to output.

The work of opening this new mine was commenced late in 1917. All that had been done up to that time was the demonstration by means of drilling that there was sufficient coal within the area controlled by the company to warrant the expenditure contemplated. A town-

site had to be laid out, the land cleared, buildings constructed for the housing of plant and bungalows built for the accommodation of employees. All this was done and now the work is practically completed. At the same time the mine work was advanced with the utmost vigor. Three slopes were driven—one the meanway, one for haulage and one the airway. At the face of the manway, at a depth of 196 ft., the coal was 11 ft. in thickness and, from reports, has continued at about this thickness up to the present. The coal is of good quality.



LEFT—MAIN HOISTING SLOPE AND ENTRANCE TO NO. 1 SOUTH AND NO. 1 NORTH LEVELS. RIGHT—FACE OF NO. 1 SOUTH LEVEL, SHOWING TEN FEET OF COAL IN THE DOUGLAS SEAM

A level was driven to the right at a point 175 ft. down to connect with the other two slopes driven from the surface. This was driven in a seam running between 10 and 11 ft., so that the three slopes are in a good substantial seam of coal.

At the start a temporary tippie was used, but the main tippie structure now is underway and should be ready for use soon. A large brick smokestack has been constructed and two 250-hp. boilers as well as two Stirling water-tube boilers are being installed. There also is a modern pumping plant, while a sawmill has been erected capable of turning out 12,000 ft. a day.

To provide storage for railroad cars a long siding of standard gage has been constructed to parallel the Esquimalt & Nanaimo Ry. From this spur a standard gage railway has been built approximately one mile in length to the mine site. At the end of this spur is the mine yard trackage. George Fraser, a mining man of experience and ability who is well-known in British Columbia, is the general superintendent.

It is the intention of the Granby Consolidated Mining and Smelting Co. to use the greater part of the coal from its Island mine for the making of coke, modern by-product ovens for which purpose are in process of construction at Anyox, B. C., the company's coast mining and smelting center. These ovens, it is reported, will be ready in the course of a few months. Work on them is being pushed forward as rapidly as possible.

Complete Gasification of Coal

BY M. MEREDITH
Liverpool, England

In view of the atmosphere of controversy which at present surrounds the problem of carbonization, and particularly the future methods to be employed, it is interesting to refer to endeavors which are being made in the direction of the complete gasification of coal and coke in one operation. It is generally known that if a ton of coal is treated in special equipment for the purpose it may, apart from the ash it contains, be converted entirely into gas, of which product it will yield some 65,000 cu.ft., having a calorific power of about 375 B.t.u. per cubic foot. The "double-gas" plant for this purpose is the invention of an Englishman, and particulars are now at hand of an equipment which is being employed for the same purpose in Germany, and which is made by the well known Dellwik water-gas company of Frankfurt.

The apparatus possesses some novel features, but consists in the main of a producer, the lower portion of which is divided into two halves by a curtain wall. Coal is fed into the upper portion and is converted into coke before reaching the divided chamber. The process is similar to that employed with the ordinary type of water-gas plant, in that air and gas are admitted at intermittent periods. In this case, however, a superheated supply of air is utilized, and by this means the fuel in the coke chambers is raised to a temperature of 1400 deg. C., the producer gas being taken off at a point which corresponds with the zone where the coal is completely changed into coke.

During the gas-making period a gas outlet is opened above the coal bed, superheated steam is admitted to the base of the producer, and the water-gas thus produced

rises through the coke and passes upward through the entire column of coal. This water-gas at the time of its formation is at a temperature of some 1300 deg. C. and provides the greater part of the heat for the carbonization of the coal, the gases from which are swept from the producer and carried through subsequent equipment of the ordinary type for the removal of sulphuretted hydrogen, tar and ammonia. Condensation is largely effected in the upper layers of the coal bed so that the gas leaves the producer outlet at a temperature of only some 200 deg. C. The producer gas yielded during the blowing period is not wasted, but is utilized for superheating the steam for gas-making.

The duration of the intermittent periods of blowing and gas-making varies in accordance with the kind of coal employed, but generally speaking the "blow" continues for from one to three minutes, while gas-making may be carried on for from five to ten minutes. It is found that by employing an excess of steam a maximum of ammonia is obtained.

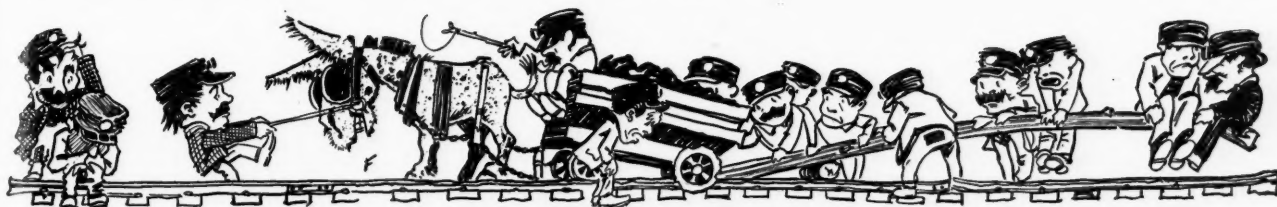
An unsatisfactory feature of the process, a feature which is absent from the English system, is the necessity for admitting a certain quantity of air during gas-making. It is said that the quantity of heat demanded for the coking of the coal is greater than that which can be supplied from the stream of water-gas, and hence the necessity for introducing air; but it seems that by modifications in the working it is possible to produce a gas of moderately high calorific power or one of lower quality. When a comparatively good coal is employed the final mixture of gases obtained contains 50 per cent. of hydrogen, 10 per cent. of methane, 30 per cent. of carbon monoxide and 1 per cent. of unsaturated hydrocarbons. The calculated calorific power of such a gas is 384 B.t.u. per cubic foot.

Legal Department

DAMAGES FOR WRONGFUL DISCHARGE—An employee wrongfully discharged under a contract engaging his services for a definite term is entitled to recover salary for the unexpired portion of the contract term, less earnings in other employment during that time. (Texas Court of Civil Appeals, *Consumers' Lignite Co. vs. James*, 204 Southwestern Reporter, 719.)

LIABILITY ON COAL DEALER'S BOND—Under a bond given by a wholesale dealer to secure compliance on his part with a contract for the purchase of fuel, including a provision that he would make monthly settlement for deliveries, the selling coal-mining company was not bound to terminate the contract, nor to notify the surety, on failure of the dealer to make payments when due, and failure to do either does not preclude the company from enforcing the bond against the surety. (Alabama Supreme Court, *Alabama Fuel and Iron Co. vs. Alabama Fidelity and Casualty Co.*, 79 Southern Reporter, 57.)

DEFECT IN COAL-HANDLING DEVICE—Defendant, a company which constructed a coal-handling device for plaintiff's employer, a coal company, is not liable for injury sustained by plaintiff through defective construction by defendant of a guard rail forming part of the work, if there was no knowledge on defendant's part that the particular defect would prove to be imminently dangerous to life or limb. (Wisconsin Supreme Court, *Miller vs. Mead-Morrison Co.*, 166 Northwestern Reporter, 315.)



Need of Efficiency in Coal Mining

BY SPECIAL CORRESPONDENT

SYNOPSIS—Many mines today are being operated by the antiquated methods of a generation or two ago. Old, obsolete, broken-down much-repaired machinery is in quite a few cases being employed to the distinct disadvantage of the owners. If cost of delays from such equipment was charged where it should be, the faulty machines would be promptly placed where they belong—on the scrap heap.

RECENTLY I visited one of the oldest mining properties in West Virginia. This mine puts out about 800 tons of coal per day, and it only requires 14 men and one perfectly good mule to get the cars onto and off the dump. The tippie payroll amounts to barely \$48.50 per shift, or only slightly over 6c. per ton of coal handled.

While this dumping cost (which does not include the mule's expenses) might rightly be considered as being "up to G," it is not so far above that of many mines as to be prominent through its isolation. It is high, yes, outrageously high, yet not higher than that at many another operation of similar character. Around even the average mine many leaks—in the shape of unnecessary daymen, for instance—may be found. Such needless drains in any well-organized business of some other nature would inevitably mean one of two things, either financial ruin or a new manager—possibly both.

It is no uncommon sight about coal mines to see a motorman using (or attempting to use) a locomotive that is either about half as heavy as it should be for the work in hand, or one that has long since "seen its best days" and been fit only for the scrap heap. When such a machine breaks down (as it does almost hourly) it blocks other motors that may possibly be in good condition, keeps coal off the tippie and lays the tippie gang—dumpers, trammers, weighmen, pickers, loaders, spotters—idle. Thus a totally unnecessary expense is added to the cost of each ton of output; and this increment of cost that ought never to have existed at all is invisible, as such, on the cost sheet.

The foreman is not infrequently compelled to remark, "Yes, that old piece of junk called a mining machine over in the fourth left burned out again today, and six men had to knock off." This machine has a record for doing this very thing, particularly when the pit boss wants to do a good day's work. Here is another case of trying to get service out of the unserviceable. This machine has been broken and repaired until it is a creditable monument to the ingenuity (I dare not say

skill) of the repairman. As a matter of fact, it is a labyrinthine conglomeration of yokes, tie rods, braces, cunningly devised forgings, reinforcing plates, patch bolts and solder, with possibly a few hundred yards of insulating tape thrown in for good measure.

The condition of this mining machine has been brought repeatedly to the attention of the superintendent and master mechanic. They either believe that it is good policy to "worry along" or know that the machine in toto should be replaced, but have been prevented from procuring a new one by the man higher up. Such higher-ups often "steam-roller" a requisition for a new machine, yet readily O.K. a request covering repairs for some old obsolete contraption. They are firmly convinced of the villainy, ignorance and general depravity of the machine runner. If he continually breaks his old machine, why in the name of common sense should they pay out good money in buying a new machine for him to smash up?

Then there is the question of rolling stock. How many times have you seen a locomotive tug and pull and groan and grind and slip its drivers in an attempt to start a trip of cars that any healthy mule should be able to pull. Next time you see this give the wheels or boxes the "once-over" at close range. You will find dry journals or wheels that have long since eked out or ground out or spun out their normal existence and performed their intended duty or that for which they were designed. Usually such wheels will be found to be of the ancient plainbore type—and in poor condition at that.

HARD ON THE THIRD COMMANDMENT

The motorman may sand the rails and turn on the current; the triprider may grin; the pitboss may wax impatient; and the third commandment be strained far beyond its elastic limit or even smashed to smithereens—yet the motor refuses to mote the cars to tippie. And back in the mine two or three or a dozen or more loaders wait (for a while) for the empties they should have received as soon as their last car was loaded. Fifteen minutes, twenty minutes, maybe half an hour they wait. Then they fill their pipes, light up and light out—for home. Out on the tippie the dump crew organizes itself into a board of naval strategy to determine why the German grand fleet did not come out from behind Heligoland while the war was on.

A few hard-running cars are burning up what is left of the locomotive, consuming untold energy, delaying the transportation system all the way from the working face to the tippie, while the high peak load caused by the stubborn journals keeps the power house man on

the jump putting in the circuit breaker. Every time the breaker goes out it means that everything on the circuit is deprived of "juice" and comes to a standstill until the breaker is put back in again.

Those old car wheels have dripped oil from the working face to the dump and back again times without number. The oiler is kept busy with a 1½ in. by 2-ft. gun, squirting black strap at or on (not always into) the journal boxes. The tippie floor reeks with it, is swamped with it, sometimes shoesole deep; and the dump crew (sometimes purposely, sometimes otherwise) slip and skid and slide and skate about as if in a sure-enough rink. Nobody can assign any good reason why oil should be smeared all over the lease when it ought to be employed in the car wheels. Application elsewhere is utterly unnecessary, as there are many types of wheels on the market so constructed as to confine the lubricant where it is needed—against the wearing surface.

In many mines one storage battery would do the work of six or seven mules and an equal number of skimmers. One motorman and one triprider would replace the whole gang. In spite of this, however, the Missouri locomotive is still doing duty (that is, after a fashion), still getting crippled, still eating good hay and grain and other food whether he works or not, when he might be replaced by steel and iron and copper and lead and chemicals, etc., at a great saving. Of course, some mines cannot profitably displace mules with storage-battery motors, but most mines can do so to advantage. There is a mighty good way to solve this question, however, and every operator should *know* what is the cheapest method of handling his output.

How much money is wasted annually by coal men in lubricants because they have not taken the trouble to find out or demonstrate just what kind of grease or oil they should use upon each type of machine? And how many machines are damaged yearly by having the wrong kind of lubricant applied to their bearings?

A friend of mine has several barrels of a certain lubricant that he purchased for a particular purpose without ascertaining if it was the proper kind to use. After he had bought this and had it delivered and stored away in his warehouse, the maker of the machine upon which he intended to use the grease came along and told him that if he used this particular grease his machine would be in the shop in less than a month. Foolishness? Yes. Carelessness? Assuredly. Still this is an existing case, and many such could be found if all the men who had made similar purchases were frank enough to own up to them and admit the facts.

Of all business men under the sun, the coal operators are perhaps the ones most thoroughly tied, bound, manacled, straight-jacketed, lashed and cobwebbed to precedent. Many of them appear utterly incapable of standing on their own feet and deciding for themselves.

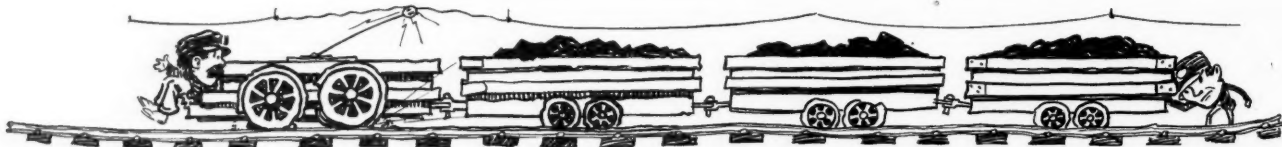
They must do as the other fellow does, or as those have done who have preceded them. This propensity has caused coal men to lose many dollars. For instance, a man bought a certain kind of equipment. It was practically untried, and there appeared to be every reason in the world why it should be a failure. Nevertheless his friend bought the same equipment because the first man did. It did prove a failure, and they both lost heavily by the deal.

The other day I was talking to a man who has been operating mines for twenty years, and he asked me about a certain widely advertised mine appliance, one that has stood the gaff of practical, hard service for years, but not in this man's section of the country. He told me he would like to buy this equipment, but he did not know what his men would think about it. It was a new appliance in his field and he believed he would wait awhile. This device would undoubtedly have proved a money saver, and his men would have welcomed it, but the operator had to take a step by himself not in accordance with precedent. No other man near him was using this particular equipment and he was afraid to trust to his own judgment.

In any other business now existing that is one-fiftieth as large as the coal industry there are efficiency engineers, men who earn their daily biscuits by scheming up ways and means to reduce the cost of production or of manufacture. Any piece of equipment or any method for lessening the cost of the product by even the smallest amount is eagerly investigated and, if it stands the light of this investigation, adopted.

Suppose that all delays, lost tonnage, etc., caused by poor rolling stock, locomotives and mine cars were charged up to haulage on the daily cost sheet. Suppose that the lubricant wasted around the mines and which should be in the wheels of this rolling stock were carried as a wastage item. Suppose that lost tonnage and lost day labor were charged up to mining machinery when the old, antiquated, much repaired, patched-up mining machines laid down and died, or, as they sometimes do, "played 'possum," how would all this appear on the daily cost sheet? Suppose that the time lost fooling with an old worn-out dump, repairing it and trying to get it to do the duty of a good one, were charged up to that particular piece of machinery on the tippie where it was installed. It would be reasonable, doubtless, to expect that some changes would be made.

If the losses caused by poor equipment could be charged (and they should be) to the direct cause of loss, and to that particular classification of costs to which they belong, many of the old worn-out and inefficient pieces of apparatus would be promptly replaced by modern, money-saving, time-saving and efficient equipment. There would be a man whose duty it would be to investigate and ascertain by what means every item appearing in the daily cost sheets could be made



more efficient—be made to do the same work for less money or more work for the same money.

Every mining man knows that the foregoing statements are substantially true, but they do not realize just what the numerous small items of loss amount to in a year's time; consequently, little effort is made to improve conditions. Put these items on the daily cost sheet in dollars and cents, and their importance is made immediately apparent.

The largest concerns in the coal business are among those who ignore these facts. I have in mind, however, one large concern that employs an efficiency expert. And if you doubt the utility of this expert, glance at the report of this company's excess profits tax. It will be an eye-opener, especially if it is compared with that of some of the other companies who produce about the same amount of coal in the same district from the same seams and sell in the same markets.

If anyone doubts the contentions I have here set up, let him look around in his own neighborhood, single out the man who has the best, most efficient, modern equipment, and compare his costs with those of the man who is worrying along with the same type of equipment that his father and grandfather used before



him merely because he possesses this equipment and can worry along with it. The time is coming when the coal operator will be forced to get a much greater degree of efficiency out of his equipment or go out of business.

Unfortunately, mining apparatus has a marked and pronounced proclivity for breaking down one piece at a time—for dying piecemeal. This imposes upon the operator the difficult problem of determining when the machine has been so thoroughly "shot to pieces" as to make scrapping advisable. A boon would be conferred on humanity in general and upon the coal operator in particular, by the manufacturer who could so design and build his equipment that it would fail as did the wonderful one-horse chaise—"to wonct."

Down on His Luck

A superintendent in charge of a Pennsylvania low vein mine was on his way to the office one morning when he met a miner going home. As he was short of men he asked the miner what the trouble was, and was informed by him that he was quitting.

"Why are you quitting?" asked the superintendent.

"Well, I don't have any luck here any more, that's why."

"What's the matter with your luck?"

"Well, I walked a mile to my room this morning, and after getting there I laid down and rolled 200 ft. into my place and landed with my back to the face. Rolled out and in again five times, and landed the same way every time. I'm going to the thick vein district."

Signaling in British Coal Mines Under the New Act

(Concluded from page 980)

primary cells, or from the colliery electrical service, the potential being reduced to 25 volts by the aid of a motor generator.

When a signal is sent from the bottom it rings the bell in the engine room and closes a switch, which connects the proper lamp with the battery or dynamo. At the pit bottom two possible arrangements are made, either what the makers call a switch selector and push, or a number of separate pushes. The selector is a multiple switch, formed by an arm sweeping over a number of contacts arranged on the arc of a circle. A pointer is provided on the outside of the selector, and the bottom cager moves the pointer to the number corresponding to the signal he wishes to give, and presses the push as many times as he wishes to sound strokes on the bell. The top cager has a somewhat similar outfit. With the separate pushes mounted on a board, and numbered according to the signals to be given, either the bottom or top cagers merely press the button corresponding to the number of the signal as many times as they require to sound gongs.

This apparatus requires rather a large number of wires in the shaft—as many wires as there are signals to be given, and one more. These may be separately insulated and made up into a multiple cable, and led to each signaling station. Where two or more beds are worked from the same shaft, the cager at each bottom will have a similar outfit, and provision is made on the indicator for each signal from each landing. The number of wires required will thus be increased by the number of additional signals. In my opinion, the use of multiple cables in the shaft is a disadvantage.

The signals are canceled automatically when the engine commences to move. In the case of the apparatus first described, this is accomplished by an additional electromagnet, whose circuit is closed when the engine commences to move. This is made to release the pawl holding the ratchet in position, a spring on the axle of the ratchet causing it to move back so as to bring the pointer and the flag to zero. In the indicator apparatus each signal wipes out the one that preceded it through a system of electric contacts. The last, or standing signal is of course only obliterated when the engine moves.

Another requirement of the new rules is that there shall be no sparking into a free atmosphere in any part of any signaling system. The system of signals that has been most largely employed on engine planes is one wherein contact is made between two naked galvanized iron wires, stretched on insulators along the side of the road. The naked iron wires must now be displaced by insulated wires and contacts made inside of gas-proof and flame-proof cases.

In one system, worked out by an eminent mining engineer, a number of switch boxes are placed at different points along the road and moving contact arms actuated in each, by mechanical-pull signal wires, arranged by the side of the road. Thus a signal can be sent from any part of the road, as with the old arrangement.

Winning the War with Coal

BY VAL FISHER

New York City

When the complete story of England's magnificent effort and sacrifice in the war is told, a chapter reflecting at once achievements among the most brilliant and revealing the debt of gratitude under which she has placed America through services to the American army must be given the prosaic title, "Coal." In the same narrative must be told how every man, woman and child in England went gladly without accustomed warmth last winter, through lack of fuel, in order that coal could be supplied in quantities sufficient to bring the American armies to France to stay the onward rush of the Germans last March, and in order that warmth and comfort could be supplied to them in proportion as every additional American soldier was landed in the battle zone. For the demand on England's already heavily-taxed coal supply was not only marked by every transport bringing troops to Europe, but for the maintenance there, as stated, of every one of our boys.

English mothers and children bore this sacrifice gladly, as they have borne numerous others during the conflict. They even smiled at the announcements of the coal controller that their rations of fuel this winter, owing to the heavy demands of Italy, France and the United States in the manner explained, would be less than half those of previous winters. They even declared that they would save a quarter of their meager allowance, and all indications now point to the realization of the general ambition in this respect.

HOW 1917 COAL OUTPUT WAS CONSUMED

An examination of the coal statistics of Britain in war time provides an interesting story. In 1917 the output was consumed as follows:

	Tons
Coal hoisted in 1917.....	248,000,000
Used at mines	18,000,000
Balance	230,000,000
Total exports to Allies, Neutrals and British possessions	35,000,000
Leaving a balance to be consumed as bunker coal, Admiralty requirements for munitions purposes, for domestic consumption and otherwise of.....	195,000,000

The causes of the shortage of coal for domestic consumption in England are several. The chief one, however, resulted from the enemy offensive last spring, when the Germans, owing to the Russian breakdown, brought their whole strength to bear in the West and seriously threatened the Allied line. The military situation affected coal conditions in two ways: (1) It was necessary for the safety of the Allied lines for England to comb out the miners for the army of resistance. The experts decided on making soldiers out of 100,000 mine workers. (2) The second attack in April in the north of France involved a serious loss in the output from those mines just behind the British lines that had been recovered from the Germans, thus rendering it vitally necessary for Britain to increase the supply of coal to France by several millions of tons a year, with the possibility of a still further increase in case these mines should be entirely lost. Owing to this possibility of further demand, the authorities decided to take but 75,000 men from among the miners for the army. In addition Britain was faced with fresh demands at home for naval

and military purposes, the greatest item of which was that of the ever-growing American army in transport to France and when there.

We have been taught that coal is king, and this has long been accepted as an axiom, especially in commerce; but the story of how the English have used coal as a lever with which to enlist the aid of half the neutral world in winning the war for the Allies, leaves no doubt as to the truth of the saying. And too much could not be said for the business ingenuity and adroitness which has employed every ton of British coal to the advantage of the Allies. The whole story may not as yet be told, but enough of it may be indicated to demonstrate the brilliant talent used in our behalf.

It is a fact not generally recognized that as a result of Britain's coal supply and of her clever use of it neutral shipping is largely responsible for the presence to-day in France of the vast American army which took its part in the struggle. The shipping obtained with this coal also has been used in keeping France and Italy supplied with food, coal and munitions, to say nothing of the Serbian army and that at Saloniki and in Palestine.

BRITISH COAL SUPPLY USED AS WEAPON

Thus it will be seen that the supply by Britain of coal to neutrals is not a matter of pounds, shillings and pence, but actually of life and death itself. Unless Britain sends coals to neutrals, Germany does so, her coal carrying with it the obligation of the recipient to send back in exchange food and products that may be used in furthering the enemy's supply of munitions of war. Though the Germans are in worse straits than Britain for coal, even so they are using it as a weapon in the manner indicated for neutral support to their utmost.

In short, the ability of England to send coal to neutrals is of both positive and negative value—positive in enabling her to barter for food, iron ore, etc., and shipping in return, and negative in enabling her to place a check on the export of war materials from neutral countries to Germany.

For instance, by supplying a definite quantity of coal to one country (Norway) England obtains the use practically of the whole of that country's mercantile marine, amounting to several hundred thousands of tons, in addition to foodstuffs and other necessities. Every cargo of British coal landed in that country means the use of one of its ships with which to carry coal to France or Italy or foodstuffs to these countries.

Britain uses coal in fighting Germany for the butter and foodstuffs of another country (Denmark). From this latter country she has likewise obtained the use of tonnage to a lesser though not an unimportant degree. And an arrangement with still another country (Sweden) has worked to material advantage in ships and important national products placed at her disposal.

Certain supplies of war materials from neutral countries to fortify Germany's effort have been either entirely stopped or reduced materially in return for British coal.

It is the trading power of British coal again that brings to her shores regular consignments of iron ore from still another country (Spain), this being sent back

to France and other theaters of war, of course in the form of munitions of all kinds.

Sir Guy Calthorp, the British Coal Controller, has taken care that the vital importance of coal as thus explained in the winning of the war should be made known throughout the length and breadth of the land, and the people understood the situation thoroughly. In order to prosecute a nation-wide publicity campaign, he induced Lord Northcliffe to lend, as chief of the publicity, the news edition of the *Daily Mail* and a regular editorial staff was organized by Walter Fish, the members of this staff writing daily on coal economy and its necessity in all its phases both for the metropolitan and country newspapers and periodicals, in addition to preparing pamphlets and handbills for distribution in this campaign of education. The crusade is being aided by officials high and low—the mayors of cities, members of Parliament, the clergy and school teachers everywhere—who have enlisted the aid of children in distributing pamphlets. It has been explained to the people that though England starts the present winter short of 30,000,000 tons of coal, some 9,000,000 tons should be saved by the rationing system. It is pointed out that though the deficit of 97,000,000 tons may not be found, it can be reduced only if the miners dig more coal and the householders use less than their ration. Even then the supplies of coal to the industrial world will be short of requirements.

COAL SUPPLY VITAL TO INDUSTRY

The coal controller already has received deputations from a number of industries, such as woolen and pottery manufacturers, fabric dyers, bleachers, printers and finishers, pointing out that the reduction in coal curtailed the wage-earning capacity of their employees and threatens to inflict hardships on their work people.

Small wonder, then, that the people of England were impressed by the situation and as usual were willing and even glad to face the discomfort and rigors of a cold and damp winter in their usual ardor to aid in the speedy winning of the war!

The British coal controller recently distributed broadcast a hand bill containing the following:

COAL IS THE KEY TO VICTORY—MARSHAL FOCH

British coal supports the war in France. It is the great source of power. It is wanted for moving trains. It is wanted for driving ships. It is wanted for making munitions. It is wanted for high explosives. It is wanted to exchange for food and ships.

All the Allies want British coal and must have it. The Germans have seized French coal fields. Italy has none, America's coal is too far away. It is Britain's part to supply them all.

All the coal you save is used for war purposes—to bring victory nearer.

Another handbill gave details of how to save coal, telling users to mix coke with it, to take the coal out of the fire on going to bed to save the cinders, etc. Thus is coal being used in the interests of democracy.

Bituminous Coal Loaded at Lake Erie Docks During Month of October

Loading of bituminous coal for the lake trade at Lake Erie ports set a new high record in October, the revised and final report of the Ore and Coal Exchange, of Cleveland, shows. In the month 4,855,068.90 tons of cargo coal and 188,818.10 tons of vessel fuel, a total of 5,043,887 tons, were dumped. For the season to Nov. 1, the grand total of cargo and vessel coal now is 26,728,722.94 tons. This is a tonnage far in excess of that moved by lake in the corresponding period of any previous season. Loading of bituminous coal, including

BITUMINOUS COAL LOADED AT LAKE ERIE PORTS

Port	Dock	Cargo	In October		Total	Season to Nov. 1		Total
			Vessel Fuel			Vessel Fuel		
Toledo.....	Baltimore & Ohio.....	569,964.65	15,205.65	585,170.30	2,707,235.85	58,729.45	2,765,965.30	
Toledo.....	Hocking Valley.....	862,545.95	23,221.15	885,767.10	4,462,753.55	127,397.20	4,590,150.75	
Toledo.....	Toledo & Ohio Central.....	352,369.60	7,267.45	359,637.05	1,951,059.60	50,883.60	2,001,943.20	
Sandusky.....	Pennsylvania.....	446,254.60	10,245.90	456,500.50	2,210,662.80	54,487.00	2,265,149.80	
Huron.....	Wheeling & Lake Erie.....	320,999.35	11,390.60	332,389.95	1,926,074.20	68,952.30	1,995,026.50	
Lorain.....	Baltimore & Ohio.....	570,577.60	14,825.30	585,402.90	2,944,166.90	82,780.55	3,026,897.45	
Cleveland.....	Erie.....	130,662.90	4,343.70	135,006.60	618,013.85	20,471.85	638,485.70	
Cleveland.....	Pennsylvania.....	399,048.45	39,356.65	438,405.10	2,299,623.99	263,597.95	2,563,221.94	
Fairport.....	Baltimore & Ohio.....	84,718.15	7,016.00	91,734.15	234,042.80	41,142.20	275,185.00	
Ashtabula.....	New York Central.....	275,802.70	28,955.20	304,757.90	1,811,092.25	193,118.35	2,004,210.60	
Ashtabula.....	Pennsylvania.....	310,919.90	13,383.65	324,303.55	1,338,876.45	76,313.20	1,415,189.65	
Conneaut.....	Bessemer & Lake Erie.....	329,294.25	4,731.55	334,025.80	2,059,731.65	30,187.25	2,089,918.90	
Erie.....	Pennsylvania Lines West.....	105,956.80	4,081.40	110,038.20	618,899.25	34,732.60	653,631.85	
Erie.....	Pennsylvania Lines East.....	95,954.00	4,794.50	100,748.50	428,942.80	14,803.50	443,746.30	
Total.....		4,855,068.90	188,818.10	5,043,887.00	25,611,125.94	1,117,597.00	26,728,722.94	

In a statement to the public the coal controller says: "Notwithstanding economies already made, we are still on the danger line and the facts cannot be too insistently and too often brought to the notice of the people of this country. The stocks of our munition works are being eaten into, gas and electric companies are crying for coal to build up their stocks against the winter months. These stocks are not being accumulated at the present time; they are being drawn upon and we have not been able to fulfill our coal obligation to our Allies. The miners' leaders have promised to do their utmost to induce the men to increase the output, and the public is being asked to do its part in reducing the consumption of coke, gas and electricity to a minimum. It is a race with winter. Every consumer should try to manage on three-quarters of his ration. The quarter saved will help to keep our brave soldiers warm."

vessel fuel, for the season to Nov. 1 has been: April, 686,852.64 tons; May, 3,194,193.10; June, 3,539,352.30; July, 4,234,305.05; August, 4,996,929.95; September, 4,851,197.90; October, 5,043,887. The 26,728,722.94 tons of bituminous dumped in the season to Nov. 1 is divided into 25,611,125.94 tons of cargo coal and 1,117,597 tons of vessel fuel. The table shown above, the official compilation of the Ore and Coal Exchange, which is handling the Great Lakes vessel pool, gives the statistics in detail.

One pound of pure carbon produces, when completely burned, about 14,500 B.t.u. and requires about 12 lb. of air for its combustion. However, commercial fuels contain combustible matter which forms the ash; this inert combustible matter uses up heat when it is raised to the temperature of the burning fuel.

Use of Methane as a Fuel

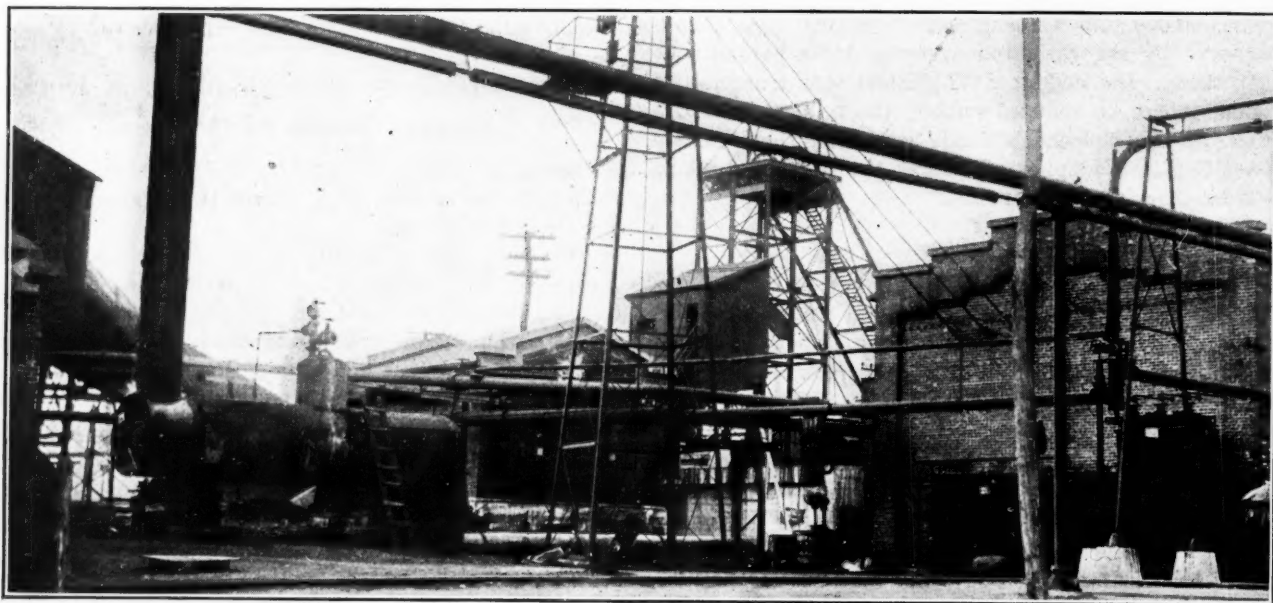
BY GEORGE W. WILLIAMS
Wilkes-Barre, Penn.

The millions of cubic feet of methane which are drawn by fans daily from the anthracite mines, in order to make mining less hazardous, may possibly be harnessed, despite the contrary view of many experts, and utilized in a commercial way. The combustibility of methane is not disputed, but whether this terror of the mines, pure or in a mechanical mixture with air, can be put to use as fuel is a matter that men of thought and vision are trying to work out in the hard-coal fields.

Two big problems relative to the possibility of giving methane a commercial value are now in the hands of mine students in the Wyoming Valley. The first of these, and probably the more important, is to determine the value of the methane content of mine air. The second is whether the return air from mines, containing

At the Loomis colliery of the Delaware, Lackawanna & Western Co., at Nanticoke, Penn., there has been erected an experimental station that may quickly and without danger of contradiction decide the question of the commercial worth of methane. It is not the type of plant that denotes permanence, neither has it an expensive foundation. It does not give evidence of coal company lavishness. It does represent a purpose, however, and what it lacks in substantiality and cost is fully made up in the determination back of the motive—the earnest zeal for solving one of the unique mine questions of the century.

This experimental station was erected at the direction of W. W. Ingliss, vice president and general manager of the Delaware, Lackawanna & Western Company, and stands in close proximity to the big Loomis breaker. It takes form in a locomotive boiler fitted with a smoke stack about 30 ft. high. Fifty feet distant is the big mine fan of the Loomis colliery, which



EXPERIMENTAL STATION ERECTED AT NANTICOKE, PENN., TO TEST AVAILABILITY OF METHANE AS A FUEL

1 per cent. of methane and less oxygen than pure air, can produce a greater heat for the coal consumed than can pure air alone.

Most problems of this sort are eventually solved through study and experiment, and it follows that any coal corporation sufficiently interested to go to the expense and trouble of almost public experiment must have found some fact in laboratory work on which to base expectation and hope.

Months ago Governor Martin Brumbaugh of Pennsylvania wrote to an official of the Delaware, Lackawanna & Western, Coal Department, and suggested that the millions of cubic feet of methane going to waste and the millions of cubic feet more left untapped in the earth be put to some practical use. That message did not fall on deaf ears, for out of it has grown, following long study and work in the laboratories of that company, a determination to test in some conclusive manner the possibility of commercially utilizing methane—a question that has enthusiastic champions and perhaps just as positive antagonists.

for years has been throwing the impurities of the mine into the atmosphere. To conduct these to the boiler an airway has been built.

The natural operation of the fan would be to throw out its mixtures above the mouth of the feed line. To divert the course of such mixtures a smaller fan has been installed in the airway 6 ft. from the intake, and by this means a certain amount of air is shunted and forced to the base of the boiler. Thus instead of taking air from the atmosphere for the purpose of burning coal, the current comes from the fan drift; and here comes the chance to experiment with the first of the big questions to be determined—that of learning the value of the methane content of mine air, the plan being of course to consume or take advantage of the methane constituent of this air, which is about 1 per cent.

It is stated that the first experiment will be made with this equipment while connected with the mine drift, and that after the value of the methane content of the air has been determined further tests will be made by obtaining the air supply from the atmosphere.

The principle of the experiment is plain. In determining the value of methane in the return air current a unit weight of coal will be consumed and the water evaporation noted. The equipment will then be changed in order that the air supply be obtained from the atmosphere, under which condition an equal unit of coal will be burned and the water evaporation noted for comparison.

At this point the second of the big questions presents itself. It is well known that the return air from the Loomis mine contains 1 per cent. of methane. As a matter of fact it contains less oxygen than is found in the atmosphere. Oxygen is the supporter of combustion, and in the return air from the mine oxygen is present in less degree than in atmospheric air. Whether the return air can produce more heat for less coal consumed than pure atmospheric air becomes then a most interesting matter.

Comparisons are always of interest. In the case of the Loomis experiments the existing facts may afford interesting study. Analysis of pure air, as all mine students know, shows the following: O, 20.93 per cent.; CO₂, 0.03 per cent.; N, 79.04 per cent. State reports show the analysis of Loomis mine air to be O, 20 per cent.; CH₄, 1 per cent.; CO₂, 0.07 per cent.; N, 78.93 per cent.

Will the return air, with 1 per cent. methane as shown in the foregoing analysis, and its 20 per cent. of oxygen, produce results equal to those secured when using pure air containing 20.93 per cent. of oxygen?

The Loomis is one of the most gaseous mines of the Wyoming Valley. Two fans are constantly in operation drawing impurities from the underground workings. The larger of these draws off every 24 hours 3,451,680 cu.ft., or 77.6 tons, of methane. The smaller one throws off 2,462,400 cu.ft. each 24 hours, or 55.4 tons, making a total of 5,914,080 cu.ft., or 133 tons of combustible gas exhausted from this mine each day.

Just what will be the result of the Loomis experiments is problematical, but they bring forcibly to light the fact that a big company and capable men are just now groping in the darkness, as it were, on the methane question. While they have not as yet laid their hands on facts and conditions that indicate any revolution in the anthracite industry, they are thinking and working, and out of their earnest effort is certain ultimately to come definite conclusions as to the possibilities, positive and negative, of the great methane question.

Treatment of Burns with Wax

The war has revolutionized surgery, and perhaps in no way more completely than in the treatment of burns by the wax method. The men of the mines, whether official or subordinate, have had for many years such an expert knowledge of the dressing of burns, obtained by them in first-aid instruction, that everyone in the industry will be interested in a new method of treatment in which a preparation of paraffin wax applied hot replaces all the old medicaments, some of which tended to spoil and become septic and none of which gave perfect satisfaction even when correctly applied. The wax, or Ambrine, becomes liquid at about 120 deg. Fahr. After being heated to a sterilizing temperature for

10 minutes it is placed in a water-jacketed atomizer which keeps it at a temperature of between 140 and 150 deg. Fahr. Before application the burns, regardless of character, are thoroughly dried. Then an air-tight covering of paraffin wax is applied to the burned area and allowed to extend a half inch beyond it. A thin layer of cotton is then laid over the waxed area and is incorporated into the first film of paraffin wax by painting with a fine varnish brush sufficient wax to completely impregnate the cotton. The wax "sets" in a few seconds. The dressing is then completed by swathing the entire waxed area in cotton and bandages. Every 24 hours the burns are redressed. The wax tends to splint the wound and to keep the temperature constant and favorable for skin renewal and repair. In a short time secretions form under the dressing, and these make the wax nonadhesive so that it can be readily removed without pain or injury. As soon as the granulating area shows only slight secretions, the dressing may be renewed every 48 hours.

The new wax treatment was invented 16 years ago in China by a Frenchman, Barthe de Sandfordt, but it did not make much headway. Five years ago attempts were made to market it in America but without much success. The war developed the treatment so rapidly that now it has received almost international indorsement. The United States army purchased during the war no less than 5000 to 6000 lb. of the Ambrine wax per day, the whole product of the factory. Even then enough was not being produced to satisfy the demands.

Ambrine can be used successfully not only with superficial burns but with those of second and third degrees of severity. It is used for the treatment also of cuts, lacerations, abrasions, amputations, chilblains, frost bites, bruises, sprains, boils, whitlows and most forms of skin affections. It really does not cure the injuries described but gives nature the chance it desires to do its own curative work. Many of the methods used today and in the past involve such painful operations in dressing the wound that the operation is not only terribly distressing but retards the cure of the afflicted member and leaves the patient permanently disfigured.

According to William O'Neill Sherman, chief surgeon of the Carnegie Steel Co., in his paper, published in April of the present year in *Surgery, Gynecology and Obstetrics*, an article, by the way, submitted by request of the Committee of Medical Research of the Council of National Defense: "To seal up an infected wound was thought to be contrary to all sound surgical principles. Notwithstanding this, the patients [at Issy-les-Moulineaux] were being dressed without pain; they were recovering in one-third to one-half the time required under former methods and free from cicatricial contraction with a minimum of scar tissue."

He adds: "Very few who have witnessed this treatment at first hand have failed to acknowledge its unquestioned superiority over every other known method."

According to Dr. Sherman improvements of technique in the United States have made it possible to dress "the largest burns in 5 to 8 min., without much discomfort or annoyance to the patient." The men in the employ of the Carnegie Steel Co. having learned from the experience of their fellow workmen are beginning to ask that the method be used in their treatment.

Occlusion of Explosive Gases in Coal

By JAMES ASHWORTH

Consulting Mining Engineer, Vancouver, B. C., Canada

SYNOPSIS— *Authoritative tests of coal dust show presence of ethane. The gas also found in samples of mine atmospheres. Possibilities of occluded gas existing in a liquid form, under high pressure, suggested by the continuous outflow of gas and dust, in the outbursts at the Morrissey mines. Methane given off largely by coal; but ethane and propane yielded mostly by fine dust, which emphasizes the dangerous nature of such dust. Safety to be sought in a careful study of best methods of working coal mines.*

AT FIRST, it may seem a ridiculous question to ask, "In what way is gas held in coal seams?" The majority of mining people will immediately reply that it is held in the crevices, cracks and bedding planes common to the coal formations. It has, however, been well known to many close investigators that the solution of the question is not simple.

Some years ago when I first visited British Columbia, and the Crow's Nest Pass coalfield in particular, I formed the opinion that ethane (C_2H_6) was a component part of the so-called firedamp of the mines. This opinion was confirmed, a little later, by tests made on fine coal dust, collected and taken to England in sealed canisters. The tests were made by Prof. Phillips-Bedson of the Armstrong College, Newcastle-on-Tyne, whose fame as an investigator of the gases occluded in coal is world wide. A few years later, these results were confirmed by Prof. John Cadman (now, Sir John), who discovered ethane in a sample of the atmospheres of the Belle Vue mine, which is on the Alberta side of the Crow's Nest Pass.

DISCOVERED ETHANE AND HYDROGEN IN ANALYZING SAMPLES OF MINE AIR

Later still Dr. Haanel, chief of the Dominion government laboratories at Ottawa, discovered ethane and also indications of hydrogen in samples of mine air submitted to him for analysis. Again, the British Columbian Minister of Mines' report for 1917 contains some extended information on this subject, as the result of an investigation made by George S. Rice, Chief Engineer of the United States Bureau of Mines, while investigating the cause of "bumps" at Fernie.

The analyses and tests of gases and coal dusts, made by A. C. Fieldner, chemist of the United States Bureau of Mines, who developed some new methods of testing coals for their occluded gases, showed the average percentage composition of the coals tested was as follows: Moisture 0.51; volatile combustible matter 26.62; fixed carbon 66.78; ash 6.10; sulphur 0.37 per cent. All the samples, after gathering, were placed in sealed jars, so as to retain any gases that might be given off in transit. However, on opening some of the jars under water it was found that they were at atmospheric pressure, and any gas that may have been given off had escaped.

These samples were all obtained from the coal seams in nut-sized pieces.

In mines of a gaseous character, explosive gases are usually found to be highly compressed; but, in the tests so far made, in the Crow's Nest Pass Coal Company's Coal Creek mines, no high pressure gas was found, although hydrocarbon gases were found to be held in the structure of the coal and classed as "occluded" gases. Careful microscopic examinations of coals have disclosed the fact that some coals contain large quantities of microspores and megaspores, which are known to be the seeds of mosses.

This particular subject has been, and is still, the life-long work of James Lomax and his daughter, at Bolton, England. They and their friends hope to be able to determine, by this means, what coal seams are particularly dangerous both in respect to gas and dust. I feel, however, that this does not offer the best solution to the problem of mine explosions.

DO OCCLUDED GASES EXIST AS LIQUIDS IN COAL?

For some years past, probably since 1904, I have been of the opinion that some of the most dangerous explosive gases exist, in many coal seams, in the form of liquids, which when the pressure is reduced break away the coal, and continue breaking it away until exhausted. In no other way can I account for the extremely dangerous and destructive effects of the outbursts of gas that have occurred, from time to time, in this district, especially in the Morrissey mines of the Crow's Nest Pass coalfield.

In practically all the cases that occurred, the outbursts of gas continued for some considerable time, and were of such volume that the gas came out of the mine at the intake opening, while the fan on the return opening was running at full speed. With the rush of gas came, also, great volumes of coal dust as fine as soot. The total weight of dust, in one case, was estimated at five thousand tons. The cavities left by the displacement of the coal were, in all cases, at right angles to the strike of the seam. It is easy to understand that if this gas had been compressed in a cavity already existing, it would have burst forth in one huge volume, but that was not the case.

Reading a recent publication of the U. S. Bureau of Mines, Bulletin 148, by J. O. Lewis, entitled "Some Physical Properties of Petroleum and Gases," my attention was arrested by the following statement regarding the solubility of gases in petroleum:

Under the same conditions of temperature and pressure, a particular oil will absorb a fixed proportion of a particular gas; but this proportion or "coefficient of absorption," as it is called, varies with each oil and each gas. The gas is held absorbed in the oil in the same way that soda water is charged with carbon dioxide. The proportion of gas absorbed is lessened under high temperatures, but is greatly increased under high pressures, in accordance with Henry's law of gases. Enormous quantities of gas are held in solution under the high initial pressure found in some oil wells. Some of the constituent gases are condensed at these high pressures just as in a compressor plant; and, as long as a

high enough pressure is maintained, exist as liquids dissolved in the oil. Under such conditions the gas is not absorbed as a gas, but as one liquid dissolved in another; and a much greater proportion of gas can be held in solution when in liquified form than when uncondensed. Other gases (methane, ethane and propane) are never liquified at the pressures and temperatures in oil sands penetrated by wells, but are always found as gases dissolved or absorbed in the oil. They constitute the so-called dry gases.

In testing the Coal Creek (Fernie, B. C.) coals for their occluded gases Mr. Fieldner did not air-dry them but ground them up in a special mill. The results that he obtained were 37.6 c.c. of methane, and 126.0 c.c. of ethane, besides 11.9 c.c. of carbon dioxide and 24.4 c.c. of nitrogen, making a total of 199.9 c.c. of gas from each 100 grams of coal. It is very noticeable that, in transit from the mine to the laboratory, practically no methane, ethane, or carbon dioxide were given off. That the ethane was not produced from the heat generated during the grinding was proved by the fact that in some of the tests made of coal from the same mines no ethane was found.

Samples of coal from the Nanaimo mines showed that coal from No. 1 mine contained 62.7 c.c. of methane and 21.9 c.c. of ethane, per 100 grams of coal, while another sample contained 128.6 c.c. of methane, and 29.8 of ethane. But samples taken from the Reserve mine, where a disastrous explosion occurred a few years ago, showed that both ethane, propane and methane were present. One sample from this mine yielded 20.5 c.c. ethane and 5.7 c.c. propane; another sample, 5.0 c.c. ethane and 11.9 c.c. propane. Tests made on special samples of mine air sent to the Canadian Department of Mines, from Michel, showed a trace of hydrogen in two cases, but no ethane.

METHANE GIVEN OFF BY COAL, WHILE ETHANE AND PROPANE YIELDED BY FINE DUST

From the above tests it would appear that methane is readily given off by coal, while ethane and propane are found more frequently when the coal is finely crushed. Some physicists assert that films of gas are held, on the surface of the particles of coal, under such tension that the gas is in a compressed state equivalent to liquefaction. It has been found that large volumes of gas are continuously given off from the working face, particularly in some of the Michel mines, as reported by the chief inspector of mines, in the British Columbia Minister of Mine's report for 1916.

In the tables appended to the report just mentioned it appears that the volume of gas found in the return air and classed as methane, is very large, and it has been found necessary to limit coal getting at the faces to one shift, each 24 hours. The tabulated percentage of explosive gases carried by the return air does not include all of the occluded gases in the coal. Mr. Fieldner's investigations reveal the presence of other hydrocarbon gases, such as ethane and propane, and a suspicion of hydrogen, in each minute particle of coal dust. It follows, therefore, that the fine coal dust is of an especially dangerous character.

Having ascertained with almost absolute certainty the way in which explosive gases are contained in the structure of coal seams, it now becomes necessary to ascertain in what way the mines can be worked with the greatest degree of safety. The evidence shows that the

mines of the Crow's Nest Pass are generally worked on some form of pillar-and-stall system. It has also been shown that every pillar is a constant producer of highly explosive gas, and it follows that the greater the number of pillars, or more properly speaking, the greater the superficial area of coal exposed the greater will be the difficulty of ventilating the mine safely.

In regard to this mode of working a most extraordinary statement is made in Mr. Rice's report (British Columbia, Report of the Minister of Mines, 1917, p. 327) to the effect that during the big "bump," Nov. 8, 1916, no gas was given off. No suggestion or explanation of this is made, although, at a later date, a smaller bump in the same mine produced a large volume of gas. All but one of the bumps recorded at the Coal Creek mines have been accompanied by outbursts of explosive gases. I feel convinced that further investigation will fully bear out this short summary of the way in which explosive gases are held in a coal seam; and it only remains to discover the safest method of working coal seams to vastly improve them in point of safety.

Effect of Salt on Reinforced Concrete

It has frequently been recommended that salt be placed in the water used to mix concrete in freezing weather, in order to decrease the liability of the concrete freezing while setting and hardening. A writer in *Concrete*, who was an observer for a period of 12 years of the effect of salt on reinforced concrete in a warm climate, concludes that salt should never be used in the construction noted. While the observations recorded were made on reinforced concrete in the Hawaiian Islands, where there is a warm, humid climate, still the failures of the structures were so serious and occurred within such a comparatively few years after construction that the use of salt in connection with reinforced concrete is questionable practice in any section.

A case was cited where four years from the time of completion, cracks were observed in a reinforced-concrete structure, with rust discoloration. There was evidence of internal stress which produced a bulging of the surface—the action on the concrete created by the corroding steel. It appeared that there was no protection to the steel by concrete where salt water was used in the mixing. While in the writer's opinion the action on the reinforcing was many times greater in a warm climate than in a cold one, nevertheless all engineers might well consider the possible danger to reinforced structures from the use of salt in the mixing water. In observing structures which showed failure on the Islands, everyone of them was exposed to salt influence, in many cases a small amount, but nevertheless disintegration had been abnormally fast. The structures in question had either been built under his own observation or he had carefully investigated the specifications and methods of construction.

Coal Mining Institute of America

Instead of being held at the Fort Pitt Hotel, Pittsburgh, Penn., the meeting of the Institute scheduled for Dec. 4 and 5 will convene in the auditorium of the Chamber of Commerce. The Institute Dinner will be held in the English Room of the Fort Pitt Hotel.



Difference of Opinion Exists Regarding Retention of Zoning Plan

The proposed retention of the zone system by the Fuel Administration is bringing out varied opinions from railroads. Some are insistent that the zone system should be abolished, while others maintain that it is an innovation which should have been put in force many years ago. An analysis of the opinions expressed, however, show that the question of getting coal cheapest is the ruling factor. In certain cases where the retention of the zone system will mean cheaper coal in some districts, the railroads are anxious to have the zones retained. In other regions, where exactly the opposite condition prevails, the railroads are urging the abandonment of the zones.

Changes To Be Made in Anthracite Budget

Areas farthest from the mines, or those which have obtained only a small proportion of their allotment, are to receive anthracite supplies first. A readjustment of the anthracite budget has been made necessary by decreased production. Owing to well-distributed reserves of bituminous coal, it is believed that no particular hardship will result even if it should prove impossible to supply the full quota of anthracite. Shipments of anthracite to the Northwest by way of the Lakes will end with the sailings of Nov. 30. New England is to receive 100 carloads daily. It is estimated that the production of anthracite has been reduced by 1,680,000 tons because of influenza and the celebrations of the signing of the armistice.

No Shortage of Coke Expected

While no slump is expected in the demand for coke, the prevailing opinion in Washington is that production needs no further stimulation. If it were not for the reduction of output caused by influenza, there would even now be more coke than is being called for. Probabilities indicate that many of the ovens built to take care of the war demand must be abandoned sooner or later. The increased number of byproduct ovens also has an important bearing on the situation. It is estimated that 1,000,000 tons of byproduct coke which have been going into war industries now will be available for other purposes.

During the war, it is estimated that the maximum tonnage of coke which was moved by the Fuel Administration, contrary to the intention of the producers, in no month exceeded 2 per cent. of production; that

is to say, the maximum amount interfered with did not exceed 50,000 tons in any one month.

The cordial cooperation of the coke operators is coming in for warm praise. One of the greatest factors in saving the several serious situations which arose in coke supply is said to have been the unusual faithfulness and pluck of the workmen in the Connellsville district. The same cannot be said of labor in the Alabama district, however, where the high percentages of absences from work greatly interfered with production.

Would Abandon Government Coal Prices

Suggestions that the price schedule be abandoned are reaching the Fuel Administration. The desire for that action, it is said, comes largely from the producers of high-grade coals, the price of which probably would rise if the present maximum were removed. The principal argument for the removal of the price schedule is that the established maximum tends to stabilize a higher price to the public than is justified in the district where there is a surplus of coal.

Railroad Congestion Hampers Coal Movement

An unexpected difficulty has arisen which is hampering coal distribution. The signing of the armistice has brought up the question of what disposition to make of Government property intended for war use. Many thousands of freight cars were loaded with munitions and other war materials. They are no longer needed in France. As a result they have been placed on sidings, wherever possible, and are jamming many ports. Facilities for unloading and storing such great quantities of material are not available at many places where these cars are held awaiting orders. As a result a large amount of rolling stock is tied up while yards and terminals at many points are badly congested.

Far West Has Plenty of Coal

A surplus of coal exists throughout the entire country west of the Mississippi River, according to S. L. Yerkes, assistant director of distribution for the Fuel Administration. Mr. Yerkes just has returned to Washington after a tour of the western coal fields. Oil has been fairly plentiful in the far West throughout the war. Mr. Yerkes' investigation showed that there had been little substitution of coal for oil.

Considerable movement of coal is now in progress between Utah and the Hawaiian Islands, but Mr. Yerkes

is not at all sure that the exportation of Utah coal to the west coast of South America can continue after the shipping situation eases up. The advantages of having a higher grade coal, a shorter haul to the seaboard and a shorter steaming mileage favor the recovery of this business by the mines near the east coast.

Coal-handling facilities at Pacific ports are ample for present and prospective needs, Mr. Yerkes reports. The facilities at San Francisco will be improved materially in the near future by the installation of a new plant of large capacity to handle both cargo and bunker coal.

Mr. Yerkes returned by way of New Orleans, where he advised with the Board of Commissioners of the port with regard to plans being made for improved coal-handling facilities there. He approved of plans for facilities handling 300 tons per hour. In this he differs from views held at the Shipping Board that a much larger plant should be put into operation at New Orleans.

Anthracite Miners To Be Released from Service

Thousands of anthracite miners are to be released from the army to aid in increasing the production of anthracite coal, the United States Fuel Administration announced on Nov. 20. Telegrams bearing instructions to this end have been sent to all camps in the United States by order of the Secretary of War, who acted on the request of Dr. Garfield.

The instructions of the Secretary of War direct that anthracite miners be segregated and sent to Washington, where those who desire to resume their work in the anthracite fields will be given immediate discharge. The need of increased anthracite production was strongly urged to the Secretary of War. This production, it was pointed out, has been cut 25 per cent. in six weeks by influenza and through the falling off in production inevitable upon announcement of the armistice.

Middle West Traffic Situation Good

Commenting on the traffic situation in the Middle West, as it affects coal, Hale Holden, regional director of railroads, says:

Coal loading generally for the central western region showed an increase of 15.5 per cent. during October. In the western fields of Colorado, Utah and Wyoming there is every evidence that the market was kept completely full of coal. The coal situation in Illinois and Indiana has been most satisfactory and the loading has exceeded all previous months of the year except July, which was the record month. The reports of the fourteen roads that originate 90 per cent. of the bituminous coal produced in Illinois and Indiana totaled the following:

	October
Cars loaded, 1918	189,772
Cars loaded, 1917	157,139
Increase over previous year.....	32,633 — 20.7%

Adding 10 per cent. for production on non-reporting roads gives a total loading of 208,749 cars in October as compared with 220,701 in July, 202,658 in August and 189,843 in September.

Notwithstanding the heavier loading, there was less complaint of car shortage than in any similar period during the past seven months. The only serious car shortage in October was on the C. C. C. & St. L. R. R., but that has been corrected and mines on that road are now enjoying full car supply.

Production of coal in these states has overtaken consumption. This was recognized by the Fuel Administration and all restrictions against furnishing bituminous coal for non-essential or non-preferential uses, even including country clubs, have been withdrawn. During the month some mines were closed for a time for lack of market, and unbilled coal in cars awaiting sale is appearing at the mines in certain fields at times in considerable quantity. As a result, some of the mines have temporarily suspended operations because, under the rules for distribution of equipment, unbilled carloads of coal are counted as cars furnished and with these on hand the rules do not permit of placing enough additional empty cars to justify resumption of operations until the unbilled coal is disposed of. Under rules of the Fuel Administration this coal could not be shipped on consignment, so it was necessary for the producer to hold the coal in cars on track or reduce the price, which has resulted in what the coal trade calls a soft market.

The outlook for the winter is better than it has been since the fall of 1915. The country is stocked up to a greater extent than ever known before. The car supply in October was better than it has been during any sustained period since July, 1916, and the mines are producing more coal than ever before in their history.

All things considered the Railroad Administration can, in respect of fuel supply, view the future in this region with serenity, confident that there will be no lack of fuel through any failure of the transportation system.

Nims Resumes His Law Practice

Harry D. Nims, formerly assistant United States Fuel Administrator, with the proximity of peace has secured his release from the heavy artillery officers' training camp at Fort Monroe, and has returned to his law office, 32 Nassau St., New York.

Fuel Administration Will "Carry On"

Despite numerous requests for reconstruction statements, the only statement which has been made at the Fuel Administration is in essence as follows:

The United States Fuel Administration, which will be terminated automatically upon proclamation of peace, will pursue its course with that end in view, relinquishing its various activities as they become unnecessary under armistice conditions, and continuing to function where its services still are required.

Reports of immediate and wholesale dissolution were said to be without foundation. Various subdivisions already are in process of winding up their duties. The Mine Track committee, and some other sections including several from the Oil Division, have been released at their request from further service, because the work which they undertook to do has been done.

Whatever machinery is necessary to the continuation of the full discharge of the duties of the administration will be retained until these duties are discharged or until the administration is relieved of them, and continuation of the larger activities of the administration through the winter was said to be the present prospect. The vigorous and careful supervision of anthracite coal was cited as an instance of the kind of work which still must be done.

The proper administration of the zoning system, under which millions of car-miles of haulage were saved and the supply of coal was correspondingly increased, was mentioned as another of the sort of duties which the administration cannot abandon forthwith, and which it will carry forward.

New West Virginia District Representative

Effective Dec. 1, R. B. Isner, of Elkins, W. Va., has been appointed district representative to succeed D. R. Lawson, of Fairmont. Mr. Isner has had long experience in handling coal matters in the district to which he is assigned. He is sales manager of the West Virginia Coal and Coke Co. Mr. Lawson has the distinction of having been the first district representative of the Fuel Administration. He is resigning to enter the coal business.

Bituminous Storage Limit Off

All storage restrictions on bituminous coal were removed on Nov. 22 by the United States Fuel Administration in conformity to the action of the War Industries Board in cancelling its preferential industries list. Anthracite coal is not affected, however, by the ruling of the Fuel Administration.

Every industry and every householder in the country now may store as much bituminous coal as desired or obtainable, as the action of the War Industries Board removes the necessity for the Fuel Administration to distinguish longer among different classes of industrial plants.

The restrictions just raised provided for the accumulation by the consumers in the preference classes defined by the War Industries Board, of reserve stocks of bituminous coal, in accordance with their location in relation to various mine fields and their classification on the preference schedule.

All industries located farthest from distribution points, particularly those in New England and in the Northwest are found not only to be well stocked, in accordance with Fuel Administration specifications, but in many cases have surpluses above those amounts.

Senate Investigating Coal Industry

The relationship between the increase in wages in the anthracite field and the amount added to the price of anthracite coal is to be probed thoroughly by the Senate Committee on Manufactures, it was indicated at the initial hearings. While the anthracite situation is to be gone into first, it is understood that a general survey is to be made of the activities of the Fuel Administration. The Committee on Manufactures, of which Senator Reed, of Missouri, is chairman, conducted an investigation of the coal situation last winter. Tactics employed during that investigation oftentimes were such as to be characterized as abusive and demagogic. That similar procedure may be expected from this investigation is predicted by some.

Senator Reed is starting out to establish that the anthracite shortage could have been met last year by washing culm banks; that culm banks were not washed to capacity because coal operators feared they would flood the market; that the Fuel Administration did not use its authority to compel coal operators to work culm banks; that the Fuel Administration either is controlled or "worked" by the anthracite operators.

James B. Neale, the director of production for the Fuel Administration, and an anthracite operator, was examined at length, but the information which he gave in reply to inquiries tended to show that the precon-

ceived notions of the committee's chairman were based on faulty premises. Arthur Learoyd, also of the Fuel Administration, replied to inquiries in regard to the distribution of anthracite which is being attacked by some of the Senators from areas denied this type of fuel. The anthracite situation in New York City was discussed Nov. 9.

Coal Loading Ahead of Last Year

At the close of business Nov. 9, 698,661 cars of coal had been loaded during 1918 in excess of those loaded during the corresponding period of 1917. Loading during the week ended Nov. 9 is reported by the Railroad Administration as follows:

	1918	1917
Total cars bituminous.....	178,535	195,006
Total cars anthracite.....	32,525	38,571
Total cars lignite.....	3,456	4,639
Grand total cars all coal.....	214,516	238,216

Zoning Eliminates Waste Haulage

Close to 200,000,000 car-miles will be saved during the present coal year by the zoning system, it is estimated at the Fuel Administration.

Early estimates were that the movement of bituminous coal affected by the zone system would involve about 300,000,000 tons, or 60 per cent. of the total production. The latest figures show that 368,858,000 net tons of this kind of coal have been produced and delivered since Apr. 1, 60 per cent. of which is affected by the zone system.

These later figures show that even more than the originally estimated 160,000,000 car-miles will be saved in round trips to and from the mines and that considerably more than the 300,000 additional trips, which the saving in car-miles would effect, will be made. Exact figures have not been compiled, but the early estimate allowed for the 300,000 additional trips being the equivalent of 5 per cent. increase in the production.

Brief Washington Notes

Restriction in the use of electricity for outdoor illumination has been left entirely to the state administrators. The national lightless night order has been cancelled, as of Nov. 20.

A policy of permanent Government ownership of coal mines and oil wells, along with railroads and the telegraph, is provided in a bill introduced in the Senate by James Hamilton Lewis, of Illinois.

A large solid silver loving cup was presented to James B. Neale by the members of his staff at the Fuel Administration on Nov. 20. The presentation was made at a dinner given for the occasion.

Coal zones L and M have been modified so as to relieve the Chesapeake & Ohio R.R. Producers in those zones now are permitted to ship into a portion of Indiana and into an increased portion of Ohio. The producing districts affected are in West Virginia and Kentucky.

Representatives of the anthracite industry have been sent to the military camps at which anthracite miners are in training. They expect to seek out the miners and try to induce them to return to that industry. They also will take the necessary steps to secure the preferential discharge of such men.

THE LABOR SITUATION

EDITED BY R. DAWSON HALL

General Labor Review

Now that the pressure of industry for more bituminous coal has entirely ceased, the Director of Production proposes to concentrate his attention on the output of anthracite, which has fallen considerably and seems hard to raise to its former level. James B. Neale has gone back to the anthracite region to do there a work larger, and one, in many ways, more difficult, than that which he tackled in western Pennsylvania and West Virginia.

The war had a peculiarly urgent appeal on the bituminous mine workers and one that, as it was new, had a more direct hold on the heart strings. The anthracite appeal is not of the same character, being civil rather than military. It comes, too, after a long period of coaxing and urging and at a time when those in other industries are letting up. It is hard to work more steadily than ever while your friends are celebrating. Much therefore is asked of the anthracite men, but, much as it is, it is quite to be expected that they will rise to the occasion. Those choice spirits among the hard coal mine workers whose work has made up for the slackness of others will still lead in devoted service and will repair the deficiencies of those who fail to visualize their duties and opportunities to serve.

TONNAGE LOST IN JUBILATION AND INFLUENZA

The daily anthracite tonnage has been largely reduced by celebrations. On Monday, Nov. 11, every colliery suspended in the Lehigh region except Hazlebrook and Cole-raine, and these are both small operations. The influenza epidemic is still a big factor in reducing colliery output. The public has assumed that, once the epidemic ceases, work will go on as ever. But it must not be overlooked that many of the victims are dead and those who have recovered from the disease are too weak for active mining for at least two weeks. In some places the disease arrived late, as at the village of the Sandy Run Colliery. After other places were for the most part clearing themselves from this disease, Sandy Run was experiencing the full force of the epidemic.

The reopening of the saloons, closed by reason of the influenza, caused a wave of drunkenness to sweep over the anthracite region. Those who were inclined to imbibe to excess took advantage of the change and celebrated the end of the war alcoholically. Though the bulk of the English-speaking mine workers are temperately inclined there were enough others to cause a large reduction in output.

The ban on public meetings is removed and this has naturally resulted in some union activity. Local union No. 311 of Plymouth, Penn., has threatened to strike unless the increased wage scale in the anthracite region is dated back to Oct. 1 instead of to Nov. 1 as Dr. Garfield provided. A delegation from the union was appointed to go to Washington and endeavor to have this change made.

The increase in the wage rate of the mine workers in the anthracite region has caused discontent among the firemen and coal shovelers of the Scranton Electric Co. These men get \$3.69 per day and want an increase of 33 per cent. or roughly \$5 per day.

In West Virginia there is still some discontent. President C. F. Keeny of District No. 17 of the United Mine Workers believes that the wage rate of the West Virginia field should be brought to an equality with the wage rate in the Indiana field and in other fields of the competitive region. The drivers in the West Virginia field receive \$4.52 a day, whereas the drivers in the other fields referred to receive \$5.

On Nov. 19, John P. White, joint director of the Bureau of Labor in the Fuel Administration, presented his resignation to Dr. Garfield, but he will still be available for con-

sultation. The resignation becomes effective Saturday, Nov. 30. In his letter to Mr. Garfield Mr. White pointed out that only a few labor disputes remain to be adjusted and added:

"I believe that I voice the sentiment of the officials of the miners' union when I state they desire to continue their affiliation with the Fuel Administration and to cooperate with it to the fullest extent until peace is promulgated."

In his acceptance, Dr. Garfield pronounced Mr. White's services "of inestimable value." The letter continued:

"It gives me pleasure to convey to you also the appreciation of the President, which he expressed to me on the several occasions when I informed him regarding your work as a member of the Fuel Administration."

Wages in Shamokin District

The new wage scale for day laborers in the ninth district as constituted by the United Mine Workers of America was announced by James Matthews, president of the district, on Nov. 19. It will be in force until the signing of the peace terms or until Mar. 31, 1920, in case peace is not signed by that date.

SHAFT WORK

	Per Day
Chargemen	\$6.10
Machine Runner	5.28
Machine Helper	4.73
Muckers	4.63
Blacksmiths	5.41
Topmen	4.10

TUNNEL WORK

Chargemen	\$6.04
Machine Runner	5.17
Machine Helper	4.63
Muckers	4.47
Mucker Boss	5.15
Blacksmith, on big machine	5.26
Blacksmith Helper	4.31

SMALL MACHINE AND SHAFT WORK

Chargemen	\$5.99
Small Machine Runner	5.26
Blacksmith	5.15
Blacksmith Helper	4.21
Muckers	4.47
Air Compressor Engineer	4.10

HAMMER WORK

Chargemen	\$5.26
Hammermen	4.94
Muckers	4.47
Blacksmith	4.94

The above rates are based on an eight-hour day.

The rates of May 16, 1916, were as follows:

SHAFT WORK

Occupation:	Rate Per Day	Rate Per Week
Chargemen	\$4.10	\$24.57
Machine Runner	2.28	19.66
Machine Helper	2.73	16.38
Muckers	2.63	15.75
Blacksmith	3.41	20.48
Blacksmith Helper	2.47	14.81
Topman	2.10	12.60

TUNNEL WORK

Chargemen	\$4.04	\$24.26
Machine Runner	3.17	19.02
Machine Helper	2.63	15.75
Mucker Boss	3.15	18.90
Muckers	2.47	14.81
Blacksmith (on big machine)	3.26	19.63
Blacksmith Helper	2.31	13.86

SMALL MACHINE AND SHAFT WORK

Chargemen	\$3.99	\$23.94
Small Machine Runner	3.26	19.53
Blacksmith	3.15	18.90
Blacksmith Helper	2.21	13.23
Muckers	2.47	14.81
Air Compressor Engineer	2.10	12.60

HAMMER WORK

Chargemen	\$3.26	\$19.53
Hammermen	2.94	17.64
Muckers	2.47	14.81
Blacksmith	2.94	17.64

EDITORIALS

Forecast: Colder Weather and Trouble

THE shortening of demand for coal makes the operator careful. As soon as he hears of it he reacts to his fears and gives orders accordingly. Doubtless operators everywhere have issued orders to their managers calling for the laying off of all men whenever the mines are idle.

There is room, of course, for some reduction in the employment of labor. Last winter men were given jobs on idle days just to prevent them from straying away to other mines and other industries. The need for such "mark time" jobs is now ended. The only orders which now stand are "parade rest" or "forward."

Though this is true there is no reason why preparation should not be made for the winter. Whether the mines work steadily or slackly the winter must be faced. Steam lines will be excessively wasteful of power if not protected. Men will be injured by falls on the unprotected stairways of tipples. Shafts will fill with ice if falling water is not taken care of.

Drifts will close if the timbering is not properly protected by ditching away springs and by adequately covering the entry with properly sloped material. Cars will leave the tracks if the tracks are not jacked up to grade—a piece of work that can be done now with difficulty and can not be done at all when the frost has struck deep. Gondolas and hopper cars will stall on the railroad tracks if those tracks are not maintained at the proper grade.

Switches will continually be filling up with ice unless they are kept high so as to make the water run from them instead of toward them. Where the banks of tramroad and railroad cuts have been allowed to fall till the talus reaches the ties, and even the rail, they should be cut back and the ditch restored. Where slack and rock banks slope down in like manner they should be trimmed to line. Where the track is likely to be heaved by frost the ditches may still be made, or, if already made, cleaned.

Motor-truck roads which are too badly tilted for safe travel in icy weather should be reggraded so as to make haulage safe. Water lines which may freeze should be covered, this being only more necessary when less water is used than it is when the full supply is being drawn on. In some places snow fences may be needed, and, where needed, should be erected.

Air stoves should be installed or built near outside pneumatic pumps. Drain valves and traps should be inserted in air lines wherever trouble from congealing water has been found in previous winters. Where water should be shut off over night and the pipes drained facilities for so doing should be provided.

Now is *not* the time for doing these things. They should have been done before; but better now than when the below-zero weather comes and stays and

makes it impossible or immensely difficult to do them. We have had a labor shortage which has delayed necessary work. Until just lately we have had no "mark-time" jobs and have given no man work which could be delayed. Then came two or three weeks when no man wanted to work if he had a chance to celebrate. Consequently, there are many of the winter needs unprovided. Before it is too late let us perform the necessary work. With judgment in buying only such labor as is actually needed, the work will pay 100 per cent. on the expenditure before the winter is over.

A Mistaken Idea

MANY purchasers and would-be purchasers of coal-mine equipment throughout the country have doubtless been much chagrined during the past several months by the poor service rendered or promised by manufacturers. It is doubtless true that many buyers have felt that in this the manufacturers are at fault—that they have taken on war business to the utter disregard of old customers simply because war business promised bigger returns.

Such a charge, however, would in the vast majority of cases be entirely unjust. The manufacturers who have put their plants upon a 100 per cent. war basis have done so because this was necessary and practically demanded by the Government. Most manufacturers much dislike to be unable to serve old customers and thus retain their business and goodwill, and it has been a decided sacrifice upon their part to place their entire output with the Government.

The past year and a half has, however, been a time for sacrifice by everyone—producers and consumers alike. Fortunately, such sacrifices have now borne abundant fruit—Prussianism has received its just reward.

Scattering What We Have Garnered

A SHORT-SIGHTED policy seems to be in effect in many of the Government bureaus at the National capital. Called into existence to function for the public good, a number of little boards that have been operated at the expense of the people since our entry into the war now refuse to release for general dissemination facts and statistics that it is no longer necessary to keep hidden. During the war it was generally conceded that the publication of certain information would give aid and comfort to the enemy, and newspapers and periodicals patriotically refrained from printing such matter. Now, however, the situation has changed. The war is over, and there is no longer any need for secrecy.

At considerable expense, and at much inconvenience to industry as a whole, various data relative to conservation, consumption and like subjects, have been accumulated by the Food and Fuel administrations, the Federal Trade Commission, the War Industries Board

and a number of others. With the declaration of peace a number of these bureaus will cease to exist. What is to become of the vast collection of vital statistics now cluttering the files of these bureaus?

Reports that reveal the most intimate details of a number of industries were compiled because of the national emergency. These reports were digested by Government-employed statisticians, and averages, ratios and comparisons were deduced. The final figures, in a great number of instances, preach veritable sermons of efficiency and inefficiency. They indicate that competitors in a given industry, with the same overhead and general conditions to meet, arrive at widely different cost totals. Figures and facts such as these should be released immediately wherever such relinquishment will work no harm to an individual or to an industry, so that the lessons they contain be taught to those most interested.

During the reconstruction period now confronting the country it is just that the frankness shown by industry in throwing open its books for the national welfare should be reciprocated by the broadcasting to industry of the data collected by the nation. Boards and officials should be shorn of the power to withhold such information when it is asked for by accredited interests or the recognized organs of an industry. This broader concept of the rights of the public should light on all Government officials at once, before the documents have been filed away in some musty vault, never again, perhaps, to see the light of day.

To Increase Production of Anthracite

HITHERTO the bulk of the effort of the Fuel Administration in boosting production has been made in the bituminous regions of Pennsylvania and West Virginia. The anthracite region was not touched. In that region the companies were conducting such an admirable campaign that Federal assistance was not so urgently needed as in the bituminous coal areas. Though the production manager of the United States came from the anthracite region, he spent most of his time in the bituminous, where he felt the greater need existed and where a dire shortage probably would have continued to exist had the war not come to an end.

Influenza, celebrations and the loss of the war appeal have caused a lowering of the output in the anthracite region. The energy of the population has declined. So far as that is due to the lack of the war impulse, it is not logically excusable. Anthracite never was a part of the sinews of war. True, the production was hampered by exigencies of the military situation, the shortage of labor being a problem arising out of the war; but it was only indirectly a military problem, for anthracite coal supplied not a military but a civil need.

Then again the influenza and the peace-making celebrations both arose out of the war. Thus the war has interfered with the anthracite industry, while the civil need for coal is as large as ever, and that need is right at home. Very properly New York was last served with coal. Its needs were last filled because it was near the mining fields and therefore less likely to be cut off. But that left the burden of supplying New York till the worst of weather, when freezing cars and barges and ice-burdened rivers would have to be dealt

with. Then the influenza and celebrations came, and New York, which was apportioned the last share, began to wonder whether there was a whole share left—if the last slice to be cut would prove not to be there at all when the cutting of it was under consideration.

Canada, the West, and New England with its inefficient gateways, of which we have heard so much, have been supplied. New York is cold. Let us trust that J. B. Neale will use his strength and energy and persuasiveness to see that care is taken of New York's needs. The miners supplied themselves with coal some time ago. They feared they might be left unprovided. Now let them see what they can do for the metropolis.

It is pleasing to have Mr. Neale protest against a recent reference in *Coal Age* to his delicate health. He assures us that he is robust and able to work untiringly. On his abilities as a speaker and organizer and on his unflagging energy New York must place reliance. It is the last bridge left across the dark waters of cold, disease and discomfort.

Don't Apostrophize Progress; Achieve It

MOST of us admire progress and pay it tribute. We like to hear and read about new developments of every kind. But industry would never make much progress if all were only hearers and readers, and no one told what he himself had done or seen done.

Well does Frederick M. Crunden preach from the facade of the St. Louis public library: "Recorded thought is our chief heritage from the past, the most lasting legacy we can leave to the future. Books are the most enduring monument of men's achievements. Only through books can civilization become cumulative."

We do not need to look back to a remote past to realize the truth of Crunden's saying. A new method is planned today; it may be recorded tomorrow; and in a few days later it has been applied in some other place with some trifling modification. This new work once recorded, a third party develops what the second party has done, and the process, method or system receives a rebirth. It passes through mind after mind, and after many transmigrations it is so changed as to be a new method.

But if an idea is not recorded, it does not receive these further refinements, and it is almost certain to die. Human progress depends on the transference of ideas, and the man who keeps his ideas to himself to gloat over, loses the great pleasure which comes from seeing them spread out and encompass the earth.

Our national life will be progressive if we exchange ideas promptly. It will be sluggish if we keep our observations to ourselves. It shows little judgment to deplore slow progress, while doing nothing to speed it. Yet that is what most of us are doing. If you have an idea lay it in the pages of a journal that it may fall therefrom like the seed of a plant and germinate the whole country over.

An assumption is too often made that a practice or method is general and so not worth recording. Sometimes, of course, this assumption is fully borne out by the facts; but much good practice is quite local and even individual, and it is the part of the technical press to introduce it to the industry wherever the practice is not known.

Keep Step or We'll Never Reach the Goal



Labor and Capital, Industry and Commerce, are running a three-legged race. If they don't keep step each with his running mate, they are sure to fall down by the way.

DISCUSSION BY READERS

Iron vs. Wood Mine Cars

Letter No. 4—In reply to the inquiry relative to the use of iron or wood mine cars, which appeared in *Coal Age*, Sept. 26, p. 615, and asked for an expression of views from practical readers in regard to the relative utility of these two types of cars, in coal mining practice, permit me to submit the following:

Owing to the severe conditions encountered in coal mining, it must be expected that mine cars will vary greatly in respect to the details of their construction. The type of car employed, in any case, must conform to such conditions as the height of seam, nature of top and bottom, quality and use of the coal, dimensions of shaft, method of payment for coal loaded, and numerous other items that influence to a greater or less degree the design of a mine car.

Before a final selection of mining equipment is made, careful consideration should be given to the many aspects that bear on the economic and successful working of the property considered. The capacity, shape and dimensions of the mine car, the material entering its construction, kind of wheels, bearings and axles, lubrication and, finally the choice between a tight- and an open-end car—all have an influence on the selection of the equipment.

THREE TYPES OF CARS, CLASSIFIED BY MATERIAL USED IN THEIR CONSTRUCTION

There are three types of cars in general use in coal mines. These may be classed, according to the material used in their construction, as wood, steel and a composite type combining both of these materials. Where wood mine cars are used in the Eastern and Southern coal fields of the United States, they are usually built of white oak, the bottom boards being 3 in. thick, and the side, flare, door and end boards 1½ in. thick. In the extreme west and northwest sections of the United States and Canada, the high cost of white oak makes its use prohibitive, and what is known as "Douglas fir" is used in the construction of wood cars. This timber, however, is not to be compared with white oak for that purpose.

Briefly stated the attractiveness of the wood mine car consists in its cheapness and the ease with which it can be repaired by unskilled labor. In coal fields where wood and labor are cheap, these cars are built in the mine shops and the necessary iron parts, wheels and axles are obtained from manufacturers. But, even so, the superiority of the steel or iron car is now being generally recognized, and the use of this material is rapidly supplanting that of wood, for the purpose named.

The advantages of steel or iron, in the construction of mine cars, may be briefly stated as follows: (1) For the same outside dimensions, the capacity of a steel car is from 10 to 20 per cent. greater than that

of a wood car designed for the same service, and the height of the car can be cut down from 4 to 6 in., which makes it particularly adapted for use in low seams. (2) Less muscular effort is required to move the car. (3) The cost of maintenance is less. (4) Steel or iron will stand the severe usage, in mines, better than wood, and survive many wrecks that would reduce a wood car to splinters. (5) The car retains its form and does not droop at the ends like a wood car. (6) The car is tighter and there is a less loss of coal in transit.

Arrayed against these advantages, however, are the higher cost of the material, which may be 40 or 50 per cent. greater than that of wood. Owing to its lack of flexibility, an iron car may not ride the rails with the same ease and, when derailed, cannot be replaced on the track as readily as a wood car.

SECTIONS BOLTED INSTEAD OF RIVETED TOGETHER

In the use of iron and steel, let me suggest that the car should be built in sections and fastened together with bolts rather than rivets, which will facilitate the replacing of a damaged section and the straightening of bent plates. At some mines, where steel cars are in use, a crib or cage is built of ties. This is made large enough to admit a car, which can then be straightened by means of jacks placed between the crib and the car. Trouble is often experienced when straightening a car, by reason of the end gate not closing properly, as it is difficult to secure the same alignment as before the damage was done. For this reason, I would advise the use of a steel or iron car having a tight end, wherever a rotary dump can be installed.

The use of iron cars in the working of thin seams greatly reduces the cost of brushing the roof or lifting bottom. Again, through careful investigations, made to determine the amount of muscular energy expended in the loading of coal into cars 32 in. and 52 in. in height, respectively, it has been found that the same muscular energy is required to load 29 tons of coal into the higher car as is necessary to load 44 tons into the lower car, under the same conditions. This furnishes food for thought and shows the importance of keeping the height of the mine car as low as possible, in order to secure the greatest efficiency in mine labor.

STEEL CARS USED IN PITCHING AND THIN SEAMS

In closing, let me say that my personal preference is for steel or iron cars wherever the price of the material is not prohibitive. In pitching seams, as well as in thin seams of coal, the use of the iron car is a practical advantage. At the McGillivray Coal and Coke Co.'s mine, at Coleman, Alta, Canada, which I assisted in opening, we had thirty 4½-ton steel cars equipped with automatic couplers and belts. These cars gave every satisfaction and proved an ideal type to use in a pitching seam where a large tonnage is

produced and the workings are extensive. A car of this capacity, however, could not be used in a low seam or where the miner is required to handle his cars.

In 1909, while on a trip through the East, I visited some of the largest coal mines in Pennsylvania. At the Vesta, No. 4 mine, California, Penn., which was at that time the largest mine in the world, and shipped that year 1,668,822 tons of coal, the Watt steel mine car having a capacity of 3 to 3½ tons, depending on the way it was loaded, was in use. The foreman told me he had 2350 of these cars in the mine and they were highly satisfactory. It is worthy of note that this mine, producing 7000 tons of coal a day and involving most important haulage considerations, considered this type of car the best type to use. The fact should convince the most skeptical in regard to the utility of these cars.

J. W. POWELL, Mine Manager,
Granby Cons. Mfg., Smelting and Power Co., Ltd.
Cassidy, B. C., Canada.

Reducing Ventilation at Firing Time

Letter No. 1—In Technical Paper No. 190, recently issued by the Federal Bureau of Mines under its coöperative agreement with the Illinois State Geological Survey and the University of Illinois Experiment Station, facts are presented that are intended to prove that interfering with the ventilation of a mine at shotfiring time is a dangerous practice. The writers claim it has been shown by the results of tests made in the Bruce-ton mine, that retarding the circulation in a mine at such time is not preventive of dust explosions.

This practice had been condemned some time before, by men connected with the Bureau, and it seems remarkable that, notwithstanding the objections urged and their authoritative source, the practice of interrupting ventilation at shotfiring time has not only not been stopped, but has been steadily gaining ground.

FAITH OF SHOTFIRERS IN THE PRACTICE

It is even more remarkable that shotfirers still insist on the continuance of this practice if they are convinced that many dust explosions have occurred in mines as the result of the practice. It is unbelievable that men would deliberately continue to risk their lives by adhering to an alleged useless and dangerous practice, unless their personal experience and observation has taught them that its discontinuance would increase the hazard of their work.

I have talked with shotfirers from different mining states regarding this matter, and they agree almost without exception that the presence of a strong draft at firing time is highly dangerous. They expressed their conviction that its retardation or even the entire suppression of the air current has had a protective effect in the performance of their work. They were not particularly impressed with the arguments that have been urged against interrupted ventilation at firing time, and which are based upon the fact that an occasional explosion has occurred with the fan shut down.

The practical and experienced shotfirer regards the presence of flame as a potential menace and the primary

cause of a possible explosion, whether the flame is that of a mine fire or a shot. It appears to him as inconsistent to claim that the draft must be cut off from the fire and not follow the same plan to reduce the chance of flame from a shot. The shotfirers with whom I have talked seem to fear the presence of draft and certain air conditions, at firing time, more than they do the presence of dust.

INRUSH OF AIR FOLLOWS THE FIRING OF A SHOT IN MINE WORKINGS

In order to call attention to certain phenomena accompanying the firing of shots, permit me to refer to an article that appeared in *Coal Age*, Vol. 6, p. 623, over the signature "A Mining Engineer." The writer of this article is seemingly much opposed to the practice of interrupting ventilation at shotfiring time and makes the following statement: "All will concede that an inrush of air follows a shot and continues, in point of time, until atmospheric pressure has been reached," admitting, no doubt, that when the blownout shot is a large one, the inrush following is correspondingly large.

Allowing this to be true, it must then be conceded that, as an inrush of air follows the firing of every shot, such an inrush was undoubtedly present in every case where a dust explosion resulted from a shot as the primary cause; also, that the inrush of the dust-laden air took place prior to the start of the explosion and that therefore the injection of the dust and air mixture into the place where the shot was fired produced the first manifestation of explosive combustion.

"Mining Engineer" admits that the inrush of air following the firing of a blownout shot is generally greater than the inrush following a shot which brought down the coal. Should there be dust present, it is obvious that the greater the force of the inrush the more dust will be carried by it and injected into the remaining flame. In view of this and the further fact that blownout shots are the primary cause of many dust explosions, it is but reasonable to conclude that the magnitude of the inrush of the dust-laden air is a potent factor in determining the magnitude of the subsequent explosive combustion, and the employment of any artificial means that tends to increase the force and volume of this inrush must necessarily aid in increasing the scope and intensity of the explosive combustion.

EFFECT OF DRAFT TO ASSIST IGNITION OF DUST

Therefore, I insist that the restriction of artificial draft at shot-firing time, wherever existing conditions will permit the practice, must have some merit. There is, moreover, abundant proof furnished both by mine explosions and the result of laboratory tests to support this view. For instance, in Bulletin 425, issued by the Bureau of Mines, on page 133, under the caption "Significant Points in Experiments," we read as follows:

It will be recalled, too, that Holtzswart and Meyer drew attention to the fact that no ignition was obtained if they introduced lignite dust into their apparatus and, after establishing the spark between the terminals within, disseminated the dust in the air by shaking the tube. But when the dust was puffed between the terminals by compressed air ignition occurred.

In view of this fact it would seem that better proof than has yet been given should be submitted if it is desired to show that the presence of artificial draft can

have no part in promoting explosive combustion. The fact that explosions have been produced, in the Bruce-ton experimental mine, with the fan shut down, only serves to show that the inrush of air, due to the vacuous condition caused by the cooling of the gases from the shot, was of sufficient force and volume and sufficiently dust-laden to produce explosive results when it came in contact with the remaining flame.

The practice of restricting ventilation at firing time may have its drawbacks and shortcomings and, if so it is right that they be pointed out; but the existence of such hindrances should not be used to create the impression that the theory on which the practice rests is unsound, especially in the absence of any proof to that effect. In my judgment, the surest and quickest way to dispose of the controversy regarding draft restriction and, at the same time, make real progress toward the solution of the dust-explosion problem is by definitely establishing the fundamental principles involved in the production of explosive combustion.

AIR FACTOR VS. PRESENCE OF FINE DUST

If the engineers connected with the Bruce-ton experimental mine can produce proof that explosive combustion of mine dust is effected by some such means as, say conductivity or radiation, then it must be conceded that the presence of dust is the all-important thing, and that the air factor plays but a small part in the process of explosive combustion, in which case restriction of ventilation at shotfiring time would have no value whatever. But, until that proof is forthcoming, the claim of the potency of the air factor should receive careful consideration.

The claim for the air factor is based on the theory that explosive combustion of dust is obtainable only with the assistance of a draft of sufficient force to carry the dust in suspension and the dust-laden air is injected into a heated zone having a temperature at or above the ignition point of the dust. The process is similar to that by which coal dust is burned with almost explosive effect when injected by a blast of compressed air into the combustion chamber of a furnace. If it can be shown that this is the correct view then draft, both as a fuel conveyor and in its flame-supporting capacity, must be regarded as a most potent factor in the development of explosive combustion, and consequently every available means, tending to lessen its harmful effectiveness, and permissible under existing conditions, must be employed if dust explosions in mines are to be avoided.

JOHN VERNER,

Chariton, Iowa.

Former State Mine Inspector.

Mine-Rescue Work

Letter No. 4—The discussion of mine-rescue work, in *Coal Age*, by practical men who have had experience in wearing breathing apparatus under working conditions, should be both interesting and instructive. I am sorry to say that some people, even mine superintendents and managers, have the idea that when a man dons a breathing apparatus he can do anything and everything. It is needless to say that temperature and other conditions are not considered where such statements are made by those not acquainted with mining conditions.

On one occasion when I and others who had trained in the use of breathing apparatus were called to a certain mine, we experienced just such a condition as that to which I refer. The men at the mine had been led to believe, from the talk of the mine officials, that something wonderful was to be pulled off by the men wearing the apparatus. A sort of Barnum & Bailey exhibition was expected. There was nothing, in their belief, that mine-rescue men could not do. As a result, when the miraculous did not appear, the men ridiculed our work and failed to appreciate the real value of such means of rescue.

WEARER OF APPARATUS MUST STUDY ITS CONSTRUCTION AND LIMITATIONS

Let me say that, before a man or any set of men, put on an apparatus designed to permit them to work in an irrespirable atmosphere, the construction of the apparatus must be carefully studied. The wearer of the apparatus must be thoroughly familiar with its use and the limitations of the work of rescue under such conditions as they meet in the mine.

Temperature is a most important item and must govern and control all work, in the wearing of breathing apparatus. According to the gas chart issued by the U. S. Bureau of Mines, showing the effect on man of warm, moist and still air, it is stated:

A hot, moist atmosphere prevents the evaporation of perspiration. If the hot, moist air is stationary it becomes entangled between the clothing and the skin and becomes warmed to body temperature. Hence, the body can not lose heat to the air, and the skin becomes warm, flushed and bathed in perspiration. Setting the air in motion, by a fan, whirls the hot air away from the body and allows cooler air to take its place. Hence, arises the beneficial effects of a fan in a room, even if fresh outside air cannot enter. If the wet-bulb temperature of the air is the same as that of the body, 99 deg. F., the body can not lose heat; but if the air temperature is about 70 deg. F. perspiration can evaporate. Above 75 deg. F., wet-bulb temperature, the amount of work a man can do begins to fall off. Between 80 and 85 deg. F., wet-bulb temperature, hard continuous work is almost impossible. Wet-bulb temperatures are determined with a sling psychrometer.

There is little doubt but that the data given in this statement are the results of exhaustive experimentation by the Bureau of Mines. The facts brought out in the statement should be studied by all men who may at times be called upon to wear apparatus in an irrespirable atmosphere. The most careful attention should be given to the study of these facts, by all men in charge of rescue teams.

PRECAUTIONS TO BE OBSERVED BY RESCUERS

Allow me, here, to give a word or two of advice, in line with my own experience in the wearing of apparatus in the mines of southern Illinois. First, let me urge all mine rescuers to consult with the state mine inspector or the mine management, before entering upon the tasks or duties to which they are called. It will generally be found that these men will not dictate what the rescuers should do, but will confer with them in an attempt to ascertain the best method to adopt in the interest of all concerned.

Again, where men have traveled some distance to a fresh air base, or have exerted themselves in any manner, let them rest for 10 or 15 min., until their breathing becomes normal, before attempting further efforts

with breathing apparatus. A man in charge of a crew should have them under his continual observation and never permit them to overexert themselves.

This constant watchcare of the leader will enable him to detect any signs of distress or weakness on the part of one of his men. It will, also, give the men greater confidence in themselves when they know that their movements are closely watched, and they will be less liable to become nervous, which always causes weakness. Where a man becomes nervous when wearing apparatus, his fearfulness and dread lead to weakness, and he is sure to collapse before long. Then, where one man in a crew collapses the entire crew is apt to be disorganized, because the same fear and dread takes possession of the others.

In conclusion, my advice is let mine rescuers pay little or no attention to what inexperienced men say, even though they are the mine officials in charge of the mine. If they are not acquainted with the use of breathing apparatus, they are not capable of giving advice to rescuers who wear such apparatus. Every man of a rescue team must depend wholly on his own nerve and the advice of his leader who is in charge of the team and whose duty it is to see that every precaution is taken to safeguard his men. JAMES WEIR, Supt.
Benton, Ill. Mine-Rescue Station.

Perplexities of Mine Foremen

Letter No. 3—Reading the short editorial entitled "Seeing the Boss Wastes Time and Temper," *Coal Age*, Oct. 24, p. 791, brings to my mind more forcibly than ever some of the many perplexities of mine foremen, which subject I am glad to see has been recently brought to the attention of writers in the Discussion department of the paper.

Permit me to say that the writer of the editorial to which I have referred, either from lack of experience in bossing in coal mines, or for a lack of space to discuss the situation more fully, has viewed the matter from one side only. There is a class of miners who put in more time looking for the boss than they do in working their places. There are miners who are continually looking for the boss and running to him with every little frivolous thing that the better and more efficient miners would settle for themselves.

Common sense and judgment should lead a miner to adjust those little matters and difficulties with which he knows he must contend in the mine, and not bother the boss who has business of far greater importance that requires his constant attention. As I said, there is a certain element in miners that makes too many of them ready and willing to leave their working places on the slightest pretext and wander about the mine looking for the boss. They are often only too glad to have an excuse for leaving their places.

A long experience as a miner and acting in different capacities in charge of mining work has made it clear to my mind that the average mine foreman is always ready and willing to listen to the complaints of miners when they are sincerely and honestly made. A good foreman is quick to learn the character of those miners who continually worry him with little matters that they should adjust themselves. It is well known that the impracticable methods employed by many inex-

perienced miners serve to keep their working places in an unfit condition.

A good boss is familiar with the local conditions in every miner's working place and knows that it is not necessary for him to go to many of these places every time he is asked. For this reason, he frequently pays little attention to a miner's request for him to look at his place. He knows the conditions he would find there and knows that the miner has not taken proper precautions to avoid his troubles. The whole time of the foreman could be taken up visiting such places and, in the end, little or nothing would be accomplished.

MUCH IS EXPECTED OF MINE FOREMEN

Referring again to the editorial mentioned, I cannot agree with the impression it conveys that bosses are "anxious to avoid an interview" with miners who need their advice and assistance, except under conditions such as I have described, when the mine foreman knows too well that it would be a waste of precious time. In my experience, not many foremen will delay answering a call to go to a place they know needs attention.

In speaking of the perplexities of mine foremen, the fact has been demonstrated that these officials have troubles of their own. Many things go wrong about the mine and conditions arise that make it almost impossible to get rails and props to working places as quickly as the miner thinks they should come. On this account, a miner may often be obliged to cease work until the needed material can be sent to him.

Today, when large results are expected, the foreman's attention must be given first to the more important matters required to keep the mine safe and the coal moving. A motor has broken down, a haulage rope needs to be repaired, a broken rail replaced in the track, or a fall of slate cleaned from the roadway.

Any of these things if not given immediate attention will seriously affect the output of the mine. On the other hand, a little water in a miner's place means only the loss of a few tons of coal if the miner cannot work that day because he is drowned out of his place. Of many evils hindering the production of coal, the foreman must choose the least and give his attention where it is most needed.

NEEDLESS COMPLAINTS OF TROUBLESOME MINERS

There are some miners who appear to think that the boss must look after their little troubles at once, even if he has to neglect the general and more important things of the mine. Many miners are impatient and unreasonable and quickly manifest a spirit of discontent, giving some trivial excuse for leaving their places or quitting their work in the mine. They are prone to recite their grievances to outsiders, particularly to men who are unfamiliar with mining conditions and requirements and who are easily led to believe that the miner is not treated fairly by the boss. But, in the great majority of cases, it can be said that the miner has proved trifling and troublesome and the boss is only too glad to get rid of him. As a general rule, the outsider is more ready to listen to such complaining miners than to the more conservative class.

In summing up, let me say that the average mine foreman, today, is a very busy man and can ill afford to give his time to needless complaints from miners who

are no more satisfied after the boss has done everything possible for them. The foreman has every class of inexperienced and irresponsible labor to deal with in the mine. Why then refer to him as "that dignitary," or insinuate that his time is much taken up in keeping out of the way of his men.

I am convinced that the majority of mine bosses are neither autocratic nor cowardly in dealing with their men. The best foremen are themselves experienced miners and know the difficulties the miner must meet every day. Notwithstanding his many perplexities and responsibilities, however, the foreman must keep cool and pleasant.

Rather than regarding it a great waste of time and temper on the part of the miner who must wait for the boss to come to his place or hunt him up in some part of the mine, it should be considered a greater waste of time and, possibly, temper when the boss is required to go to any remote place in the workings whenever and wherever he may be called to adjust a little matter that is in the miner's own control. JOHN ROSE,

Dayton, Tenn. Former District Mine Inspector.

Hindrances to Coal Production

Letter No. 6—I have just read the interesting letter of Joseph R. Thomas, *Coal Age*, Oct. 10, p. 710, which impressed me with the thought that if the mine officials of a company did not show favoritism of a certain kind they would be the losers. Many of their best men would be seeking work where their efforts would be recognized and rewarded. I am speaking now of the deserving ones, and do not refer to the shiftless class who are often found hanging around a mine and depend largely on the "pull" they have with the foreman.

In every well managed mine there are those who are the favorites of a good foreman. These favorites are the men who have come into the community to stay. They are men of families. In most cases, they rent company houses and trade at the company store; but they are the men who work six days in the week and produce their share of coal.

THE TRUE FAVORITES OF A GOOD FOREMAN

Is it any wonder that a mine foreman takes good care of this class of workers, gives them good places and treats them with consideration? Such treatment is only their due reward for good work and for acting in the interests of the company, which so large a class of miners fail to do but, instead, regard their own interest and convenience first.

Let me ask, again, is it strange that a foreman makes a favorite of a married man, when he knows he can depend upon him more than on a single man who is free to come and go as he may choose? Does not good management require that a foreman do this, in order to insure a steady production of coal and maintain a large output for the mine? The best workers and most reliable men should be a mine foreman's favorites.

It would, of course, be foolish for a mine foreman to decide that he would have no favorites in the mine, but would treat every man alike. For instance, suppose he should let a good place stand idle, waiting for the next man who might come along, who would probably be a tramp miner. Should such a man be given the

place after it was refused to one of the old miners when vacated a few days since, would not such treatment cause dissatisfaction? No one would blame an old miner who was refused the place, if he decided to pick up his tools and go elsewhere. As soon as the tramp miner had made his stake, he would be "Johnny on the road" to some other place.

While the favoritism described by Mr. Thomas is truly a hindrance to the production of coal, there is another hindrance that he does not mention. The wages paid, today, for company labor in and around the mines, is excessive as compared with the earnings of a man who digs coal and has his family to support. For instance, a mule driver is often a single man. He is paid \$5.25 per day, and his board costs him \$1.30 per day. He generally works four days out of the week, and the foreman must look for someone to fill his place the remaining two days. The high wages paid this man is actually a hindrance to the steady production of coal.

Numberless schemes have been devised and tried for keeping a man at work in his place. It has been found a practical impossibility, however, to compel a man to work when he wants to lay off. If a miner wants to lay idle Saturday he simply does not prepare his coal, and that lets him out. All plans to overcome this difficulty have seemingly failed.

INDIFFERENCE OF MINERS HINDERS PRODUCTION

In one instance, a miner was threatened with discharge if he did not load more coal. It made no difference to him, however, as he continued to load his six tons by noon and then lay idle or asleep in the gob until quitting time. Another miner was out three days and claimed he was sick. The foreman told him to get a doctor's certificate and he did so; but the real trouble was the whiskey bottle. Being discharged, he went to work in another mine where he did the same thing again. If it were not for these hindrances, the production of coal, today, would far exceed the demand. It reminds me of a book that I once read, in which the writer likened the laboring man to a mule, claiming that he would only work when he was hungry.

Let me sum up by saying that, in my opinion, the average man working under pressure will perform work with the least possible resistance; but, as the load is increased, the circuit breaker flies out and he ceases his activity. In face of these conditions, let me suggest that every mine should be operated on an ample margin. For example, if an output of 1000 tons a day is needed, the management should estimate on 1200 tons and, perhaps, they will realize the tonnage first named. If a miner loads 12 tons of coal a day, estimate his average as 10 tons a day, and this will require that the mine work 100 men to produce 1000 tons daily.

As a fact, the coal miners of America, today, have realized that we were at war, and they were ready to do a day's work. Notwithstanding all the hindrances that we can mention, the demand for coal has been met at the mines. The President has gotten what he asked and 2,000,000 soldiers are in France today, while the people at home have subscribed \$6,000,000,000 for the support of the war, which gives the assurance that our boys will go into Berlin and land the Kaiser and all his murderous tribes on St. Helena.

Farr, Colo.

ROBERT A. MARSHALL.

INQUIRIES OF GENERAL INTEREST

Freezing of Shaft in Winter

During the past four or five years it has been necessary to shut down our mine from three to five days each winter, owing to the air shaft freezing solid with ice. At the present time, it does not seem possible to attempt to shut off the water, which enters the shaft at a point approximately 70 ft. below the surface.

Seemingly the only alternative is to heat the intake air to a temperature above the freezing point, at times when that is necessary. In order to do this we are contemplating installing a series of steam coils, arranged in such a manner that the intake air will be drawn through the coils before reaching the fan, which is now forcing 50,000 cu.ft. of air per minute down the air shaft. We expect to heat this air from 20 deg. below zero to 40 deg. above.

As this proposition is an important one to us and will, no doubt, interest others in a like situation, will you kindly state if it is possible to accomplish our purpose in the manner proposed. It would please us to see the matter discussed in *Coal Age*, which we are sure will bring out many helpful suggestions.

—, Ill.

GENERAL SUPERINTENDENT

The heating of a large volume of intake air, by passing it over steam coils, would require a considerable distribution of the air at that point in order to enable it to absorb sufficient heat to produce the given rise of temperature (60 deg. F.). The practicability of the scheme must be determined by a calculation based on the amount of heat that must be absorbed by the volume of air to produce the desired rise in temperature, and the possibility of the air extracting this heat from the steam in the coils. Also, it will be interesting to estimate the weight of fuel burned under the boiler.

The weight of 50,000 cu.ft. of air, at a temperature of 20 deg. below zero, would be $50,000 \times 0.0903 = 4515$ lb.; or, measured at a temperature of 40 deg. F., the weight of this volume of air is practically 4000 lb. The specific heat of air, at constant pressure, is 0.2374, which is the amount of heat (B.t.u.) required to raise the temperature of 1 lb. of air 1 deg. F. Therefore, the heat required to raise 4000 lb. of air 60 deg. is $4000 \times 60 \times 0.2374 = 56,976$ B.t.u., which is the heat that the air must absorb from the steam coils each minute.

Assuming the steam pressure in the coils as, say 10 lb. gage, the heat in the steam, above 32 deg. F., at sea level, is practically 1155 B.t.u. per lb. Then, if the arrangement is such that the air passing over the coils condenses the steam and extracts enough heat to reduce the temperature of the condensed matter to, say 87 deg. F., which is hardly probable, the heat given up by a pound of steam would be $1155 + 32 - 87 = 1100$ B.t.u. On that basis the weight of water evaporated or steam condensed—in other words, the capacity of the steam plant employed for this purpose—would be $56,976 \div$

$1100 = 51.8$ lb. per min., or practically $12\frac{1}{2}$ bbl. per hour. The conditions assumed in this calculation are probably more favorable than would be realized in practice, and double or triple this evaporation may be found necessary.

Taking the efficiency of coal burned under a boiler as, say, 7 per cent., each pound of coal having a heating value of 14,000 B.t.u. per lb. would yield $14,000 \times 0.07 = 980$ B.t.u., which is the heat available in each pound of coal burned. The weight of coal that must be burned per hour, in this steam plant, to meet the requirements is then $60 (56,976 \div 980) = 3488$ lb., or say 1 $\frac{3}{4}$ tons.

The foregoing calculations show that the proposed scheme is, at the best, not practicable. The necessary distribution of the intake air over the coils, in order to permit such a large volume of air to absorb sufficient heat to raise its temperature 60 deg., would necessitate either a very large area in the fan drift, so as to reduce the velocity of the passing air and give it time to absorb the necessary heat, or baffle plates would have to be inserted to give the air current a devious course among the coils. The first of these plans presents practical difficulties that cannot be surmounted in most instances, while the second would greatly increase the drag on the air, or the resistance against which the fan must operate, and would reduce the air volume in the mine for the same power of the ventilator.

The simplest and most practicable scheme for preventing the freezing up of a wet air shaft, in winter time, is to reverse the circulation in the mine. This must be done at alternate intervals, wherever and whenever that is practicable, so as to prevent the freezing up of the hoisting shaft while thawing out the air shaft, and *vice versa*.

The difficulty presented in this inquiry is not an uncommon one. On the contrary, it is one of frequent occurrence with which the coal-mining industry has long contended. *Coal Age* will be glad to have its practical readers discuss the question broadly, giving their experiences and suggestions.

Has anyone ever tried a method of impregnating the water draining into the shaft with salt? Or what might prove more practical, spraying a brine solution over the ice formed in the shaft? A 25 per cent. brine freezes at zero (Fahr.). The application of any such scheme would involve the shipment to the mine of a carload of rock salt from the salt mines.

In the use of salt for the purpose mentioned, a more effective scheme to adopt, wherever practicable, would be to cut through the curbing at a point just below the inflow, and establish a water-ring surrounding the shaft. A steam coil introduced into this space would effectually prevent the freezing of the water, which should be drained from that point to the bottom of the shaft. Or, a pump installed at this point would effect the double purpose of preventing freezing and elevating the water to the surface. Let us have opinions, or better still, the results of experience of readers.

EXAMINATION QUESTIONS

Miscellaneous Questions

(Answered by Request)

Ques.—A horsepower of 8 produces 60,000 cu.ft. of air per min., in a certain mine. What will a horsepower of 27 produce in the same mine, under the same conditions?

Ans.—In mine ventilation, the quantity of air in circulation varies as the cube root of the power on the air. In other words, the quantity ratio is equal to the cube root of the power ratio. Therefore, calling the required volume of air x , we have, in this case,

$$\frac{x}{60,000} = \sqrt[3]{\frac{27}{8}} = \frac{3}{2} = 1.5$$

$$x = 60,000 \times 1.5 = 90,000 \text{ cu.ft. per min.}$$

Ques.—Explain the nature and cause of priming, in a steam boiler.

Ans.—The term "priming" in relation to a steam boiler means the carrying over of water into the steam pipe and cylinder of the engine. Priming may occur from any one of several causes, among which may be mentioned too high a water level in the boiler or too small a steam space, due to the improper design of the boiler. Priming may result from forcing a boiler, because of insufficient boiler power; it may also be caused by irregular firing, or the sudden opening of stop-valves. Priming may result from violent foaming in the boiler, caused by impure feedwater or the accumulation of grease and sediment in the boiler.

Ques.—Explain the reasons why a boiler feed pump will force water into a boiler when the steam pressure in the boiler is the same per square inch as that actuating the pump.

Ans.—The reason is that the steam end of the pump has a greater sectional area than the water end or plunger, which gives a greater total pressure acting on the steam piston than the total pressure exerted at the water end, against which the plunger operates. For example, assuming a 2-in. plunger operated by a 6-in. steam cylinder, since the areas of the plunger and piston vary as the squares of their diameters, the steam pressure in the cylinder will overcome nine times that in the boiler.

Ques.—How many 3-in. pipes will be required to run off as much water as one 12-in. pipe, all the pipes being of equal length?

Ans.—For the same head of water producing the flow in these pipes, all of which have the same length, the quantity of water that will flow in each pipe will vary as the square root of the fifth power of its diameter. In other words, the quantity ratio is equal to the square root of the fifth power of the diameter ratio. The diameter ratio, in this case, is $12 \div 3 = 4$. Then, calling the flow in one 3-in. pipe 1, or unity, the flow in a 12-in. pipe, under the same head, will be $\sqrt{4^5} = 32$. Therefore, one 12-in. pipe will carry 32 times the quantity

of water flowing in a 3-in. pipe, under the same head; and it will require thirty-two 3-in. pipes to run off the same quantity of water as a single 12-in. pipe, all the pipes having the same length and the same head.

Ques.—The elevation at the head of a slope is +900 ft.; the elevation at the foot of the slope is +300 ft.; the length of the slope is 1200 ft.; what is the degree of pitch of the slope?

Ans.—The vertical rise of the slope, in this case, is $900 - 300 = 600$ ft. Since the length of the slope is 1200 ft., the angle that the slope makes with the horizontal, or the slope angle, is one whose sine is $600 \div 1200 = 0.5$. From a table of sines and cosines, this angle is found to be 30 deg. The slope has, therefore, a 30-deg. pitch.

Ques.—What are the principal things to be looked after on haulage roads in mines?

Ans.—A haulage road in a mine should be as straight as possible. The track should be well ballasted, the roadway drained and timbered so as to prevent falls and give sufficient headroom for the passage of cars. The grade of the main road should favor the movement of the loaded cars, the most economical grade being from 1 to 1.5 per cent. There should be a good clearance space on the same side of the track, for the entire length of every haulage road. Where mechanical haulage is employed, there should be refuge holes cut in the rib on the same side of the track. These holes should be whitewashed and kept free from all obstruction, so that they can be quickly found when needed.

No doors should be permitted on a main haulage road in a mine. As far as practicable, doors should also be avoided on cross-entries. A door should never be erected at the foot of a sharp grade. There should be no sharp curves that would cause the derailment of a car. Where turnouts are made on haulage roads, they should be timbered without necessitating center posts between the tracks. A block or other device should be employed to prevent cars from running out onto the haulage road either from turnouts or from rooms. All switches must be well laid by good tracklayers and guard rails used to prevent cars from jumping the track when crossing a frog.

Ques.—What gases are produced by mine fires and the explosion of firedamp?

Ans.—The principal gases produced by mine fires are: Carbon dioxide (CO_2) and carbon monoxide (CO), depending on the quantity of air supplied by the fire. The explosion of a firedamp mixture, at its maximum explosive point, produces carbon dioxide (CO_2) and water vapor (H_2O). A firedamp mixture when exploded below or above this point will produce more or less carbon monoxide, and there may be some unburned marsh gas (CH_4) remaining after the explosion. In any combustion, there is always some free nitrogen remaining in the burnt air; more properly speaking, there is an excess of nitrogen in the air, following an explosion.

COAL AND COKE NEWS

Harrisburg, Penn.

The claimant is entitled to be judged dependent upon the contributions of a deceased child, if these contributions have been necessary to support, interpreted in accordance with the station of life and manner of living of those who assert such dependency, says Chairman H. A. Mackey, of the State Compensation Board, in a new decision regarding what constitutes a parent's dependency rendered in *Mickano vs. Rochester and Pittsburgh Coal and Iron Co.* "It might be shown that the child's contributions to the family purse had been necessary to maintain other members of the family in school or to furnish musical instruction to other members, or to maintain an automobile or to obtain other very proper luxuries which cannot be included in the category of actual support. We do not think that the Legislature intended that the employer should pay compensation in order to secure these items for the home."

A meeting of the State fuel administration and anthracite coal operators was held in Philadelphia, on Nov. 18, with the purpose of bringing about a larger distribution of hard coal in certain states. Dissatisfaction was expressed with the present amount of distribution. Among the states represented were South Dakota, Minnesota, Wisconsin, Indiana, Pennsylvania, Delaware, New Jersey, Connecticut and New Hampshire. Others at the meeting included J. D. A. Morrow, director of distribution of the United States Fuel Administration, and J. H. Dickson, New York; S. D. Warriner, and W. J. Richards, who constitute the anthracite committee of the National Fuel Administration.

It was explained by anthracite operators that the October production was 800,000 tons short of the same month last year, which affected the distribution in all states. This loss in output, it was said, was due to the influenza epidemic and other causes. The operators explained the situation to the state administrators and suggestions were offered looking toward a greater supply of coal to communities before severe weather sets in.

Uniontown, Penn.

Conferences of team-track coal operators with Fuel Administration officials at Washington brought no relief to that industry, threatened with extinction by the railroad order substituting open-tops for box-cars. The committee was told that the box-cars were needed for the shipment of grain, but were not given any assurances when such cars would be returned to the coal trade. The two classes of cars means a difference of 75c. per ton and the operators claim they cannot do business with a profit at the open-top fixed price of coal. In the party which went to Washington were J. D. Madigan, of Connellsville; M. Lee Titus, of Point Marion; J. C. King and J. H. Dunn, of Uniontown, officers of the Team Track Operators' Association, with their attorneys, Lee B. Brownfield and John Duggan.

Flare-up of influenza in malignant form generally throughout the Connellsville coke region reduced production of coal and coke to another low level for the week ended Nov. 16. Reports compiled at the regional fuel administration office give a total output of 573,576 tons of coal, with an aggregate loss of 37,018 tons over the previous week. Coke shipments were 258,224 tons, a drop of 19,625 tons. Coal shipments were 219,837 net tons, showing a decrease of 64,725 tons.

While there was some car shortage for the week the principal difficulty was labor shortage. Influenza has now taken hundreds of workers from mines and yards which were heretofore not affected by the disease. Their withdrawal, together with the large number of convalescents not yet able to work full time, present a grave labor problem, which however, can be but temporary. The analysis of the week's production by the fuel administration places labor shortage as responsible for the loss of 5676 cars. Car shortage itself caused a loss of 1161 cars. Cars shipped during the week were 9817 with a rating of 16,372. Loaded coke cars to the number of 6936 left the regions while 2881 cars of coal were shipped to byproduct plants and other industries.

Charleston, W. Va.

During the week ending Nov. 16 the Fairmont region received a full supply of cars, the allotment running from 1500 to 2000 cars a day. One day's supply reached 2900. There were evidences, however, of delay in placing the cars. Production loss was reduced to a minimum, not running over 1000 tons a day. A few of the mines were shut down during the week. Even team-track mines were able to secure an adequate car supply, and open-top cars at that.

Production is still running below normal in the Pocahontas and Tug River regions, due to a pronounced labor shortage. The total output, according to the last compilation, is only 415,000 tons, or an increase of 3000 tons only over the previous week. The total production loss reached 62,452 tons, 52,531 tons of which was due to labor shortage. Five thousand more tons of coke were manufactured than during the week previous, the total production being 53,251.

Notwithstanding an extremely poor power supply in the New River district during the last two weeks, there was a very material increase in production in that field during the period ending Nov. 16. The total output was 139,811 gross tons, representing a gain of 13,597 gross tons. As an instance of the conditions with which New River mines have had to contend, last Thursday was entirely lost, and during the current week there was insufficient power on Monday and Tuesday. The supply was off again on Thursday.

The mines in the Kanawha District managed to speed up production to 167,711 tons during the week ending Nov. 16, thus gaining about 5000 tons, over the previous week's production. Power shortage and a scarcity of man power handicapped operators. Only ten hours were lost from car shortage, but from a shortage of labor there was a loss of 1018 hours. A loss of 908 hours from mine disability shows to just what extent inability to get power held down the output.

As all western shipments of fuel from the Kanawha and Guyan districts are required to be rebilled at Russell, Ky., and as there were reports of the blocking of tracks there, the possibilities are that western shipments would be halted and that a number of mines might have to shut down.

Birmingham, Ala.

Coal and ore production of this section has almost returned to normal. The production of coal for the week just closed is expected to show at least 10,000 to 20,000 tons increase over what it was for the week ending Nov. 9, when 348,306 tons were recorded by the Federal Fuel Administration offices here.

The hope is expressed that the output of Alabama mines can be increased to more than 400,000 tons weekly early in December, although it is thought unlikely that 433,000 tons mined in July will be surpassed, due to the unfavorable weather conditions which in all likelihood will be experienced throughout the district at the beginning of the winter season.

There is urgent need for every ton of coal that can be mined in the entire district. Domestic orders in large numbers are yet to be filled, while industrial plants, railroad lines and steamships, negotiating the change from a war to a peace basis, will need coal and coke in steadily increasing amounts, as the commerce of the nation recovers from its war footing and begins to assume normal proportions.

There is optimism in the fact that many men, available for work in the mining district of the state, will probably be released from cantonments in this country in the next few weeks, and it seems reasonable to believe that the labor shortage which now is the bugaboo of every operator in the district will be alleviated.

It hardly seems possible that there will be any release of coal cars in the immediate future. Supplies will be shipped for Government use for several months to come, and there is not much chance of the mines in this district being furnished with additional cars, according to railroad officials in Birmingham.

New York, N. Y.

The directors of the Wholesale Coal Trade Association of New York have decided to establish a coal exchange in connection with the Association, following the submission of a report by a committee headed by C. C. Harris, of George D. Harris & Co. The report was discussed by a meeting of coalmen, including members of the Association and invited guests, held at the Whitehall Club, following the luncheon of the Association, and was adopted by the Board of Directors a few days later.

It is the purpose of the Exchange to promote better trade relations between members of the wholesale trade, to facilitate dealings between buyers and sellers, to provide a medium through which producers of coal can come in direct contact with reliable distributors of coal and to stabilize business generally. It is intended to publish a bulletin of offerings and requirements daily for distribution to members. The Bureau will not act as selling agent or purchasing agent for any member, but will attempt only to bring together parties to selling and purchasing transactions who have either in writing or verbally listed their offerings or requirements with the secretary of the Bureau.

Members desiring to purchase coal must state the quality and delivery desired, while a member offering coal for sale shall state the price, quality and to what pool it will be consigned if shipped to tidewater, and the location of the coal at the time of offering en route or at tidewater.

All offerings and requirements must be in the hands of the Secretary, in writing, by 4 p. m. for publication that afternoon, and delivery to the members the following morning. It is provided that for the present no fee is to be exacted for the service rendered until its value to members has been demonstrated. It is also provided that the Bureau will not recognize requests for listings that do not represent proposed transactions that will comply in all respects with the rules and regulations of the United States Fuel Administration. All disputes arising between parties brought together by the secretary, or arising through compliance with any rules of the Bureau, are to be referred for adjudication to the Exchange Bureau Committee, and appeals from such decision may be made to the Board of Directors whose decision shall be final.

Oklahoma City, Okla.

Coal produced in Oklahoma during the fiscal year ending June 30, 1918, amounted to 4,489,064 tons of all kinds, according to a report covering that time submitted by Edward Boyle, chief mine inspector. This is an increase of 627,367 tons over the output of a year previous. To produce this required the services of 7607 miners working an average of 189 days a man for the year. According to the report 35 men were killed in the various mines during the year.

In explaining the report, Chief Mine Inspector Boyle says: "The report shows that 7607 miners worked to produce the 4,489,064 tons of coal averaged 590 tons per man for the year ending June 30, 1918. Placing the tonnage at the average rate of \$1.01 per ton would make the earning capacity of each miner \$595.90, and adding to that 78c. extra for yardage and other deadwork would make the total earning capacity of each miner \$1036.10. From this must be subtracted the amount of explosives used. The grand total of explosives used, based upon the average cost of \$2 per keg for 133,561 kegs, would be \$367,122. The average cost per man for explosives is \$48.27. Deducting this from his earning capacity would leave a balance of \$978.83. However, this does not include expense of fuse, blacksmithing, oil, blasting, paper and other incidentals."

Victoria, B. C.

Fleet Robertson, provincial mineralogist for the Province of British Columbia, has returned from Montreal, Que., Canada, where he went, under instructions, to test the cable used in the Protection shaft of

the Western Fuel Co., of Canada, the breaking of which allowed a descending cage, loaded with miners on their way to work, to fall, carrying its passengers to instant death. It is understood that he will be able to show that the break was the result of internal corrosion brought on by the action of water. That, however, is not official, but it is known definitely that Mr. Robertson carried out some careful experiments in the laboratory of McGill University, and that, as a result, he will have some interesting statements to make, not alone as to the reason for the deterioration of the steel rope of Protection shaft, but with reference to the best means of preserving cables of similar character used in mining operations from like deterioration.

Diamond drilling of coal measures situated near the mouth of the Chemainus River, Vancouver Island, is being resumed as a result of the successful defence in the court by H. W. Treat of his Provincial title to these coal lands. The soundness of the licenses he holds, it will be recalled, was contested by the Esquimalt & Nanaimo Railway Co. Mr. Treat announced that the work would proceed a few days after the court's decision. He is of the opinion that the coal measures in question are the same as were worked by the old Wellington (B. C.) mine, the area being prospectued in this instance being about eight square miles, off the foreshore. The operations, it has been disclosed, are being carried on by the International Coal Co. at the head of which is Samuel Hill, of Seattle, Wash., son-in-law of the late railway magnate, James J. Hill. It is pointed out that one great advantage possessed by this property in the event of the existence of coal in commercial quantities being proved, is its accessibility. Its location on the waterfront, it is figured, will permit coal to be placed in the hands of dealers at least 50c. a ton cheaper than can be done in the cases of most of the Island mines.

PENNSYLVANIA

Anthracite

Mahanoy City—An explosion of gas at the No. 11 colliery of the Lehigh Coal and Navigation Co. on Nov. 18 cost the life of one man and injured six others, three seriously.

Seranton—In deeds filed on Nov. 19 in the office of the Recorder of Deeds of Lackawanna County, the John Gibbons Coal Co. gains title to property in the vicinity of Ripple St., near the operations of the concern. One piece of land, improved with a washery, switches and outbuildings, was bought for \$18,000. The grantors reserve the right to a silt bank on the lot for a term of five years. Culm and mine refuse is also included in the piece.

Plymouth—A threat to strike on Dec. 1 if the new wage scale granted recently to the miners of the anthracite field is not antedated so as to become effective Oct. 1, has been made by members of local union No. 311, of this town. A delegation from this union is to leave for Washington to try and have the wage award made retroactive. The Plymouth men contend that the workers generally are not satisfied with the terms of the latest wage agreement.

Bituminous

Midland—The Crucible Steel Co. is perfecting arrangements for the immediate construction of a large battery of coke ovens. The Cleveland & Pittsburgh Railroad Co. is making track extensions here to take care of the increased business that will result as soon as the ovens are completed.

Pittsburgh—The Moore coal holdings of approximately 2500 acres on the Youghiogheny River, in Westmoreland County, has changed hands for about \$1300 an acre, or \$3,250,000, according to an announcement made recently by a party interested in the property. It is said the coal passes to the Pittsburgh Coal Co., and at the time the deal was consummated several interests were anxious to buy the coal. It is the Pittsburgh vein, and comprises one of the largest single tracts on the Youghiogheny. Many efforts to purchase it have been made in the past, but heretofore all offers submitted have been declined.

Uniontown—An offer to either buy or sell is the answer of S. A. Carson and G. H. Hochheimer, majority stockholders of the Pennsylvania Fuel Co., on the application of F. E. Markell for a receivership. The terms of the offer are for the book value of the stock on Nov. 1. In case Markell declines to do either, the answer filed here sets forth the directors will discontinue the business and distribute the assets to the stockholders. Rigid regulation of the coal business by the Fuel Administration resulted in the reduction of salaries of officers, in one instance, \$1000 per month, the

affidavit asserts. During the coal boom Carson received a salary of \$1250 per month, and Hochheimer \$1750 per month. On Jan. 1, 1918, the papers set forth, Carson's salary was reduced to \$600 per month and that of Hochheimer to \$750 per month.

WEST VIRGINIA

Hughey—A total of \$75,000 will be expended by the Peach Creek Coal Co. upon the construction of a plant at Hughey, in Logan County, in connection with the operation of a drift mine there, work on the plant having started on Nov. 10. The company plans a capacity at the outset of 40,000 tons yearly and eventually 60,000 tons. N. E. Steele has been elected president of the new concern.

Peytona—Extensive improvements have been made by the Laurel Branch Coal Co. at its plant at Peytona on Coal River, the company having installed a new power plant and having added new mining machines to its equipment.

Williamson—Improvements have been made on an extensive scale by the Winifrede Thacker Coal Co., of which R. G. Stevens is superintendent, at its plant near here, a new 300-kw. power plant having been put in in addition to the construction of a number of miners' houses. The company has also put up a new store building.

Williamson—The capacity of the Blocton plant of the Naugatuck Coal Co. has been materially increased by the opening of a new mine in the top seam. Many new dwellings for miners and a clubhouse have been completed.

Spring—In order to keep pace with the increasing capacity of its plant and the large number of employees used, the P. M. C. Coal Co. at its plant here has found it necessary to erect more houses for miners and a new store building. The company is under the management of Earl McConaughy.

Williamson—Construction work is under way at the plant near here of the Superior Thacker Coal Co. A number of dwellings for miners as well as other new buildings for the plant are being erected.

Himler—Improvements in progress at the plant here of the Himler Coal Co. include the erection of a number of new houses.

Downs—The Rachel mine of the Consumers Fuel Co. of Pittsburgh, has wrought some decided improvements under the management of E. F. Miller. New storerooms, and an office and machine shop have been built and ninety modern dwelling houses erected. A clubhouse has been fitted up for the use of the company's employees. The mine is a shaft operation and is equipped with modern machinery throughout. Working conditions are excellent and the miners like to locate here.

ILLINOIS

Du Quoin—The Equitable Coal and Coke Co. is erecting a coal rescuer at its mine here. The work is being done by the engineering firm of Allen & Garcia, of Chicago, Ill. Construction is of steel and reinforced concrete.

Auburn—The Auburn & Alton Coal Co. made a record run at its mine on a recent Saturday when 1266 tons of coal were hoisted to the surface, after it was mined. It took 1044 pit cars to haul the coal from the mine to the elevator. This is believed to be a record for mining coal in this vicinity, and shows how hard the miners and attendants have been working to supply the coal needs of the nation. The mine has been in operation for a number of years and has always maintained a high record for efficiency. L. W. Senseney is the operator for the mine and Joseph Menzie is the mine manager.

Springfield—The production of coal in the Springfield district is now nearer normal than at any time since the influenza epidemic began. Several mines which have been shut down are now working again, and those which have had a partial force at work are now operating full time. The Jones and Adams mine, which had been working during the past few days with only 158 men, has practically its whole shift of 500 men back at work. The Woodside mine is also in full operation. Reports coming into the office of the subdistrict indicate that only about 200 miners in the Springfield subdistrict are not at work at present.

Springfield—Two former officials of the United Mine Workers, Duncan McDonald, of Springfield, and George L. Mercer, of Canton, are candidates for president of the Illinois Federation of Labor. The election is to be Tuesday Dec. 12. Each was formerly secretary-treasurer of the Illinois miners' organization. McDonald has lately devoted his efforts to furthering the cooperative movement.

Alton—Farmers in this vicinity are mining their own coal. Pits abandoned years ago are being operated to supply the rural demand and a number of new openings have been made where the coal vein is near the surface and a supply sufficient to keep the home fires burning on the farms is being taken out.

KENTUCKY

Stone—In addition to erecting a number of miners' houses at its plant at this place, the Sudduth Coal Co. has also put the finishing touches on a tippie at its No. 2 mine.

Toler—Considerable progress has been made on the new work at the plant of the Bailey Coal Co., the company having completed a number of new houses which constitute a part of the plant.

Pinson Fork—The Marietta Coal Co., which recently increased its capital from \$25,000 to \$50,000, plans development of coal properties on the Pond Creek branch of the Louisville & Nashville R. R., near Whitesburg, Ky. E. A. Gorman and Louisville interests are said to be behind developments in Perry County. However, new development work as a whole is slow just now, as labor and material are hard to secure, while conditions do not warrant any great amount of development.

ALABAMA

Sayreton—The Roberts & Schaefer Co., of Chicago, Ill., has recently completed a large new coal washer for the Republic Iron & Steel Co. at its mine here to replace the washer destroyed some months ago by fire. The washer is of the Elmore type jig.

OKLAHOMA

McAlester—The sale of the coal and asphalt deposits underlying the surface of 441,107 acres of the segregated mineral land in the Choctaw and Chickasaw Indian nations will take place here on Dec. 12. McAlester has the advantage of shipping facilities on the Missouri, Kansas & Texas and the Rock Island roads, and already is the center of a coal region with a fortnightly payroll of over \$500,000.

WASHINGTON

Seattle—Alaska has begun the shipment of its vast stores of anthracite coal, according to information received here from the northern territory. The deposits in Alaska are the only ones on the west coast and for many decades have been locked in the north by legislation. With the information of the shipment of anthracite comes the news of the completion and formal opening of the Alaska Anthracite R. R., 22 miles long, running from Controller Bay to Carbon Mountain. The first trainload of anthracite, consisting of 100 tons, reached tide-water over the new railroad. Since that the mines have been shipping 300 tons a day. It is expected the output for this year will be almost 100,000 tons.

Foreign News

Vienna (via Basel, Switzerland)—M. Zerbik, minister of public works, has asked the Austrian foreign minister to address a telegram to the governments of the United States, Great Britain and France showing the extremely critical situation in Austria concerning coal and food. The public works' minister says there is no coal for the heating of houses and that the supply for cooking will not last more than a week. Mills and bakers will be compelled to close, he adds, within a few days. No further coal supplies are available to keep the railroads running, he says, and the gas and electricity services in Vienna cannot be kept going more than two or three weeks.

Ottawa, Ont.—In a bulletin issued by the Advisory Council for Scientific and Industrial Research A. S. L. Barnes, assistant engineer of the Ontario Hydro-Electric Commission, states that it is scarcely conceivable that electric energy can successfully compete with coal, oil and gas for heating purposes. Its main use will always be for mechanical power. He points out that it would need 960,000 hp. to heat the houses of Toronto alone, while the output of Niagara is only 780,000 hp. The whole possible Ontario development would be about 6,000,000 hp., which would be quite inadequate to supply the existing homes with heating alone, exclusive of all other requirements. In any event, the cost of coal would have to rise to not less than

\$15.50 per ton before it would be as dear as electricity at 35c. per kw.-hr. Electric heaters as auxiliaries may prove useful in mild weather for short periods, but Mr. Barnes considers that there are scientific and economic difficulties which render impossible the idea that the water-power of Canada can be utilized on a large scale to solve the fuel problem.

Personals

Henry E. Mulligan, who for some time has been associated with S. D. Brady at Fairmont, W. Va., as engineer, has accepted the superintendency at the mines of the Abram's Creek Coal Co. at Oakmont.

George C. McIntosh, of Huntington, W. Va., has severed his connection with the United States Fuel Administration, where he held the post of publicity agent, to accept a similar position with the Solvay Collieries Co. with headquarters at Huntington.

John J. McNulty, mine foreman of the Thomas shaft of the Hillside Coal and Iron Co., transferred to No. 1 shaft of No. 9 colliery, Pennsylvania Coal Co., to take the place of **David Alexander**, who died recently. The change is a promotion for Mr. McNulty.

Orville Stump, superintendent of the Menden coal mine, owned by the Boonville Mining Co., of Boonville, Ind., was married Nov. 20 to Miss Lucia Hemenway, sister of James A. Hemenway, formerly United States Senator. Mr. and Mrs. Stump will reside in Boonville.

Harris Booker, of Monongahela City, Penn., has resigned as general superintendent of the Diamond Coal and Coke Co., of Pittsburgh, Penn., to accept a like position with the Unified Coal Corporation of Pittsburgh, effective Dec. 15. Mr. Booker succeeds **Edward H. Cox**, whose resignation was noted in the Nov. 21 issue of Coal Age.

Obituary

John Woodmansee, superintendent of the Hermine Coal Co., of Hermine, Penn., died recently following a lingering illness. He was 56 years old and leaves a widow and three children.

Coming Meetings

Kentucky Mining Institute will hold its winter meeting Dec. 6 and 7, at Lexington, Ky. Secretary, **Charles W. Strickland**, Huntington, W. Va.

American Society of Mechanical Engineers will hold its annual meeting Dec. 3-6 in New York. Secretary, **Calvin W. Rice**, 29 West 39th Street, New York City.

War Service Committees will meet Dec. 4, 5 and 6 at the Million Dollar Pier, Atlantic City, N. J., under the auspices of the Chamber of Commerce of the United States.

Coal Mining Institute of America will hold its annual meeting Dec. 4 and 5 in Pittsburgh, Penn. Secretary **H. D. Mason**, 911 Chamber of Commerce Building, Pittsburgh, Penn.

Publications Received

Fusibility of Coal Ash and the Determination of the Softening Temperature. By **Arns C. Fieldner**, **Albert E. Hall** and **Alexander L. Feild**. Bulletin 129. Department of the Interior, Bureau of Mines. Illustrated, 146 pp., 6 x 9 inches.

Power: Its Significance and Needs. By **Chester G. Gilbert** and **Joseph E. Pogue**, of the Division of Mineral Technology, United States National Museum. Smithsonian Institution, United States National Museum. Bulletin 102, Part 5, the Mineral Industries of the United States.

Trade Catalogs

Grounding Facts. Paragon Electric Co., Chicago, Ill. Booklet. Pp. 22, 6 x 9 in., illustrated. Embodies the results of years of experience and experimentation in this very interesting field. The booklet will afford valuable information to electrical engineers.

Curtis Pneumatic Appliances. Curtis Pneumatic Machinery Co., St. Louis, Mo. Catalog No. 63. Pp. 84, 6 x 9 in., illustrated. Covers air compressors, air hoists, trolley and trolley systems, sand blasts, pneumatic and hydro-pneumatic elevators, jib and traveling cranes.

Hess-Bright Ball Bearings. Hess-Bright Manufacturing Co., Philadelphia. Pp. 108, 5½ x 9½ in., illustrated. Bound in stiff board covers and excellently printed, the volume is in reality a treatise on the history and development of ball bearings. Typical ball-bearing applications are described and illustrated. The 26 pages in the rear of the book are devoted to general information and prices.

Industrial News

Bellaire, Ohio.—The Pittsburgh-Belmont Coal Co. has increased its capital from \$700,000 to \$800,000.

Uhrichsville, Ohio.—The Gilmore Coal Co. has been incorporated with a capital of \$10,000 by **Paul A. Romig**, **B. O'Donnell**, **W. R. Wilcox**, **P. A. Romig** and **B. B. Beltz**.

Coshocton, Ohio.—The Coshocton Valley Coal Co. has been chartered with a capital of \$25,000 to mine and sell coal by **R. H. Mills**, **F. M. Marshall**, **G. M. Marshall**, **Mary B. Mills** and **T. H. Wheeler**.

St. Louis, Mo.—The **Walter A. Zelnicker Supply Co.** announces the appointment of **Joseph Meyerson** as secretary to the president. Mr. Meyerson was associated for ten years with the Southwestern Tariff Bureau. Another addition to the company's forces is **A. Kottsieper**, who will cover the Southwestern territory.

Columbus, Ohio.—Reports show that new members of the Michigan-Ohio-Indiana Coal Association during the month of October numbered more than 20. Much interest is shown in the work of the organization, according to **B. F. Nigh**, the secretary. During August and September the association collected in excess of \$12,000 in railroad claims for its members.

Louisville, Ky.—That conditions in the coal trade are far from satisfactory at the present time is shown in the small volume of development work being undertaken in the state, and the very few new companies being chartered. For a time a dozen or more new companies were chartered weekly, but for the past two or three weeks everyone has felt satisfied with leaving well enough alone.

Louisville, Ky.—**R. C. Tway**, of Louisville, was elected president; and **John W. Williams**, vice-president, of the Harlan County Coal Operators' Association at a meeting held in Knoxville, Tenn., on Nov. 19. This organization was formed about three years ago and numbers all of the principal Harlan operators in its membership. **E. R. Clayton**, district fuel administrator, has been secretary for several years.

Charleston, W. Va.—Conviction at the June term of the United States District Court here of discrimination in the distribution of coal cars, has resulted in **I. K. Dye**, general manager of the Coal & Coke Railway Co. being sentenced to serve six months in jail and to pay a fine of \$1000. At the trial evidence was introduced tending to show that he had furnished cars to mines in which he was interested and refused them to other mines.

Norristown, Penn.—The expenses of the local emergency hospital, organized during the recent influenza epidemic, will be met by the fines of shippers of bituminous coal who charged the State Hospital for insane here prices in excess of the Government figure. The cost of maintaining the victims of the plague was \$6000, which amount has already been sent the local authorities by **William Potter**, Fuel Administrator for Pennsylvania, to whom the fines were paid.

Bluefield, W. Va.—The territory over which **R. D. Patterson**, production manager of the Tug River and Pocahontas fields, will exercise supervision, has been considerably enlarged, and in the future will embrace the Kenova, Thacker and other fields, which have heretofore been in the territory of **J. W. Dawson**, production manager. Action was taken on the change by the members of the Williamson Operators' Association at a meeting held at Williamson on Nov. 12.

Boston, Mass.—A demand for reduction of freight rates on coal coming into New England has been sent to Director General **McAdoo** of the Federal railroad administration by the Massachusetts public service commission. The commission says in its message that the present rates are clearly unjust and a grievous burden and that New England people have been trying for five months without success to obtain relief notwithstanding the promise of the director that a readjustment of rates would be made.

Charleston, W. Va.—The casualty list in the mines of the state during the month of October shows a total of 32 deaths. All but twelve of such deaths were caused by

falling coal, slate or roof. Five men were killed by mine cars, three by motors and one by a mining machine. All but three of the total number of deaths occurred inside the mines. The remaining three met their deaths under or between mine cars. The greatest number of deaths were in Fayette and McDowell Counties, there being six in each.

Toledo, Ohio.—There was a slight falling off in the tonnage loaded by the Hocking Valley docks during the week ending Nov. 16 as compared with previous weeks, but on the other hand there was a large increase in the tonnage loaded by the Toledo & Ohio Central railroad docks. The lake season is now practically over as only a few cargoes will leave the lower lake ports after Nov. 23. The Hocking Valley docks loaded 125,798 tons as compared with 160,491 tons the previous week, making a total of 4,920,858 for the season. The Toledo & Ohio Central docks during the same week loaded 135,000 tons, making a total of 2,224,000 tons for the season.

St. Louis, Mo.—The abstract and brief of the East St. Louis interests, intervenors in the bridge arbitrary case, in which the St. Louis Chamber of Commerce asks the abrogation of the 20c. a ton charged by the railroads for hauling coal from East St. Louis to St. Louis, was filed a few days ago with the Interstate Commerce Commission at Washington. The document was prepared by **R. W. Ropiequet**, attorney for the east side interests. The brief emphasizes that the differential is a long-existing relative rate adjustment based upon the natural advantage of location enjoyed by the east side because of its proximity to the coal fields.

Columbus, Ohio.—Production figures for the Southern Ohio field for the month ending Nov. 2 showed a heavy decrease, due largely to the prevalence of the influenza epidemic. The figures were given out by **W. D. McKinney**, Federal representative for the producing district: For the week ending Oct. 12 the output was 314,000 tons as compared with a capacity of 472,000 tons. For the week ending Oct. 19 the output was 355,000 tons as compared with a capacity of 487,000 tons. For the week ending Oct. 26 the output was 318,000 tons as compared with a capacity of 474,000 tons, and for the week ending Nov. 2 the output was 315,000 tons as compared with a capacity of 471,000 tons.

Charleston, W. Va.—Urging a change in the standing zone regulations governing the shipment of coal, Kanawha district operators visited Washington this week to interview officials of the United States Fuel Administration and presented their arguments for a change. Members of the party are of the opinion that the coal from the Kanawha region should be shipped into Ohio and Indiana if there is a market for it there, as is contended by shippers here, it being pointed out that the quality of the coal is such that Ohio and Indiana consumers would like to use it if it can be obtained. It is now claimed that there is no longer any necessity for shutting West Virginia coal out of certain western markets.

St. Louis, Mo.—The St. Louis Fuel Committee has taken under advisement the application of the Beckemeyer Coal Co., of Beckemeyer, Ill., for a reclassification which would take it out of the Standard group and place it in the Mt. Olive group and enable it to sell its output in St. Louis for 25c. a ton more than at present. The application is based upon the claim that the Beckemeyer coal is of Mt. Olive quality. When arguments were made recently representatives of other companies announced that if the reclassification were allowed they would ask reclassification for their product on the ground that it is as good as the Beckemeyer output. Dealers present at the conference asked that if any reclassifying was to be done that it be deferred until spring so as not to affect the value of stocks on hand.

Columbus, Ohio.—Ohio operators have been busy recently making out an entirely new set of reports to be filed with the United States Railroad Administration. The new reports show the daily capacity and also the daily output of every mine during the month of October. The daily capacity of the mines is determined by taking the total tonnage produced, dividing by the number of hours worked in producing it and multiplying the quotient by the number of hours in the recognized work day. The result is to be termed the "daily rating" of each mine and shall be the basis on which cars shall be distributed to the mine during the periods of car shortage.

Mine superintendents believe that it will be a difficult matter to increase the car supply of a mine where the production was cut to a low point during the month of October.

MARKET DEPARTMENT

Weekly Review

Fuel Administration Concentrating on Larger Anthracite Output—Changes in Distribution Program Necessary—Bituminous Production Falls Off Considerably—Market Not Affected—Restriction in Use of Soft Coal Removed

A NUMBER of plans looking toward an increased production of anthracite have been set afoot by the Federal Fuel Administration. Influenza and peace celebrations have interfered with the output of hard coal to such an extent as to make necessary the rearrangement of the program of distribution. Points farthest away from the mines will be cared for first, and shipments of hard coal will be withheld from sections that have already received their assigned quota.

War industries that had been granted preferential allotments of anthracite will receive this coal no longer, arrangement having been made to divert this tonnage to domestic purposes. Every possible endeavor is being made by the production division of the Fuel Administration to increase the output of hard coal while weather conditions are favorable, and to this end anthra-

cite miners who had enlisted or been called to the colors are being mustered out of service as quickly as they signify their intention of returning to work.

During the week ended Nov. 16 the output of hard coal amounted to 1,403,000 net tons, a daily average of 234,000 net tons compared to the same period in 1917, when the production totaled 2,041,000 net tons, a daily average of 340,000 net tons. In other words, output is now being maintained at a daily rate 100,000 tons lower than in 1917. From Apr. 1 to date the total output of anthracite is 63,381,000 net tons, as against last year's production of 64,921,000 net tons for the same period.

Bituminous also registered another drop during the week ended Nov. 16 with the output of only 9,707,000 net tons. Last year's total for the same period was 1,572,000 net tons greater. Just at present this drastic slump in

production has no particular significance, as the output of soft coal for the coal year to date is 40,213,000 net tons greater than the output for the same period in 1917.

If manufacturing industries adjust themselves rapidly to peace-time conditions demand will again become eager, and the present weakness in the bituminous market will disappear. All restrictions regarding the stocking and use of soft coal have been removed, the need for keeping close watch on the distribution of soft coal having passed. Low quality coals are being sold below the Government maximum here and there, though no cut in price has been reported for the fancy grades.

To sum up, the domestic sizes of anthracite are exceedingly scarce, while bituminous is plentiful, many mines having been forced to close down because of lack of orders.

WEEKLY COAL PRODUCTION

Improvement in the influenza situation in most producing fields was expected to bring about an increase in production during the week of Nov. 16, but the celebration attending the signing of the armistice offset whatever increase might have been so derived. The output during this week is estimated at 9,707,000 net tons, a decrease of 661,000 net tons, or 6.4 per cent. compared with the week of Nov. 9, and a decrease of 1,572,000 net tons, or 14 per cent. compared with the week of Nov. 16, 1917.

Whether the situation has any serious aspects depends upon the length of time required for general industrial conditions to become readjusted, the extent to which manufacturing activity will be resumed, and the rate of production that can be

of last year of 40,213,000 net tons, or 11.5 per cent.

The improvement in the anthracite production during the week of November 9 was but temporary, the output during the week ended November 16 decreasing 182,000 net tons, or 11.5 per cent. This output also fell below the corresponding week of 1917 by 636,000 net tons, or 31.2 per cent. The daily average during the week of November 16 is estimated at 234,000 net tons as compared with 333,000 net tons during the coal year of 1917, which practically represents the average daily requirements during this year. The total production from April 1 to date, for this year, is estimated at 63,531,000 net tons, a decrease of 1,340,000 net tons, or approximately 3 per cent. compared with the same period of 1917.

Reports from the carriers, for the week ended Nov. 16, show a decrease, in comparison with the week preceding, in cars loaded, from all districts, with the exception of the northeast Kentucky and southern West Virginia fields, southwest Virginia, and Tennessee and Kentucky. Considerable improvement occurred in these fields, while material decreases were noted in the central Pennsylvania field, where shipment declined approximately 4000 cars, or 14 per cent., in Ohio, where shipments declined approximately 3000 cars, or 15 per cent., and in Illinois, Indiana and western Kentucky, where shipments declined approximately 4000 cars, or 10 per cent. The current week's shipments fell far behind that of the corresponding week of last year, with the exception of southwest Virginia. For the coal year to date, however, the shipments in all districts still exceed the performance during the same period of 1917.

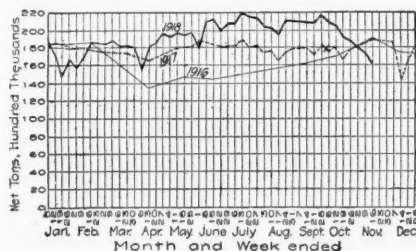
The lake dumpings of bituminous coal (including vessel fuel) fell considerably during the week of Nov. 16, and are estimated at 639,494 net tons. This tonnage is 21 per cent. behind the dumpings during the week of Nov. 9. For the coal year to date the lake tonnage is estimated at 28,477,112 net tons. The fuel requirements of the Northwest for bituminous coal by lake will be furnished.

Shipments of bituminous coal to New England during the week ended Saturday morning Nov. 16, estimated at 413,546 net

tons, fell behind the shipments during the preceding week by 31,696 net tons, or approximately 31 per cent. Of the total stated, rail receipts through the gateways amounted to 143,470 net tons, an increase over the last week of 2.5 per cent., while tidewater shipments, amounting to 270,074 net tons, decreased 11.5 per cent. Shipments from Baltimore and Hampton Roads decreased considerably during the week, while shipments from New York and Philadelphia increased 25.8 per cent. The Fuel Administration, on Nov. 16, revised the New England budget, and the shipments for the coal year to date of 18,950,455 net tons are in excess by 2 per cent. The New England receipts by rail exceed the budget for the same period by 7.1 per cent., while tidewater shipments, as a whole are 1 per cent. behind budget.

The production of beehive coke in the United States during the week ended Nov. 16 is estimated at 553,000 net tons, or approximately 1 per cent. behind the production of the week of Nov. 9 and 70,000 net tons or 11.2 per cent. behind the production during the corresponding week of 1917. The daily average during the current week is estimated at 92,000 net tons as compared with 93,000 net tons during the week preceding and 104,000 net tons during the week of Nov. 16 of last year. Operators in the Connellsville, Greensburg and Latrobe districts of Pennsylvania report production of beehive coke at 275,490 net tons and the operation of their plants at 66.4 per cent. of their full time as against 69.9 per cent. during the week of Nov. 9. The same operators produced 159,250 net tons of coke.

Repairs to plants during the week ended Nov. 16 caused production of beehive coke to decrease slightly below the production of Nov. 9. The production during the current week is estimated at 571,113 net tons, and exceeds the production of the corresponding week of 1917 by 127,895 net tons, or 28.8 per cent. The plants of the country, during the week ended Nov. 16, were operated at 88.7 per cent. of their full time, as compared with 90.2 per cent. during the week of Nov. 9. The limiting factor during the week, as above stated, was repairs to plants, loss of time attributed thereto, by the operators for the country as a whole, rising from 5.7 per cent. during the



maintained during the winter months. In the past two weeks, market conditions west of Pittsburgh have been increasingly important in affecting production. The decrease in seven weeks, or from the high mark of Sept. 28, has been 25 per cent., until new production is below current consumption. The low point for the present has been reached.

The average production per working day during the current week is estimated at 1,618,000 net tons, as compared with 1,965,000 net tons for the coal year to date, and 1,762,000 net tons for the same period of 1917. The total production from Apr. 1 to Nov. 16 is estimated at 389,024,000 net tons, an increase over the corresponding period

week of Nov. 9 to 7.4 per cent. A slight improvement was noted during the week in the labor situation. The states reporting a decrease in production during the week all attribute the falling off to repairs to plants, while those reporting improvement, with the exception of Indiana, give better labor conditions as the cause. In Indiana a better supply of coal brought about the improvement.

BUSINESS OPINIONS

The Iron Age—The decision of those in control of the steel industry at Washington to sweep away the whole scheme of priorities apart from those on merchant ship, railroad and navy material brings back at a stroke a substantially free market. Cancellations have come in plenty. Shell steel, wire, rails and car material represent the largest cancellations. A small but noteworthy inquiry for billets has come from Belgium, and 3500 tons of Bessemer bars are asked for the French Government. Ship plates are being sought for both China and Japan. The effects of the stoppage of Government work are not pronounced as yet, but some men are appearing every day at steel works gates seeking employment.

Bradstreet's—As the country shifts from a war to a peace basis, irregularity in movements, uncertainty about prices, and cancellations, the latter mostly of war-wanted products, are strongly outlined, these manifestations being accompanied by conservative optimism as to the future and readiness to believe that the country will respond to readjustment with a minimum of shock. Meantime, however, new buying in volume is in abeyance; the general disposition is to mark time pending the opening of clearly defined routes, and, in a word, there is considerable looking about to see what the dispensations of peace will bring forth to fill the gaps caused by the elimination of war work—an aspect that prominently stands out in the iron and steel trades.

Dry Goods Economist—In the cotton piece goods market speculators continue to sell cloths in the gray at prices 1 cent to 1½ cents per yard less than the Government price-fixing committee's quotations for the same counts. In some cases goods are being sold by speculators at prices at which they bought them some time ago. In some cases the War Industries Board has given notice to mills that when possible the relinquishing of certain contracts, or parts of contracts, for goods is desirable whenever possible, for the reason that the demobilization of troops will necessarily lessen the requirements of the Government. With mills, however, the total price recession does not amount to over 1½ cents a yard less than the prices made by the War Industries Board price-fixing committee.

Marshall Field & Co.—Current wholesale distribution of dry goods is running a little in excess of the heavy shipments of the corresponding week a year ago. Total orders from salesmen on the road were about the same, orders for immediate delivery were larger, while sales for future delivery were a little less. More customers were in the house than last week, but not so many as during the corresponding week of 1917. More or less inactivity in the retail business during the month of October due to the influenza epidemic and the unseasonable weather has been followed by improved conditions and merchants look to the future with optimism. The signing of the armistice points to an excellent holiday business. Collections continue good.

American Wool and Cotton Reporter—The ability or inability of foreign sellers to supply wool to the domestic market, and the price at which it can be supplied, taken in connection with the possible or probable conditions on cloth, is causing much speculation. There are those who feel that the raw material situation should be controlled by the Government until suitable arrangements can be made for placing the market on what might be considered a firmer basis. Buyers object to this plan, because they feel that prices will be lower, and they do not want any artificial market established.

Atlantic Seaboard

BOSTON

Manufacturing further curtailed. Trade settles down into grooves, with little inquiry. Practically no regulation locally. New England Fuel Administration ceases to order coal to loading piers. All-rail receipts materially reduced. Agitation for lower freight rates. Railroad fuel supply also falls off. Water receipts light. Problem to move accumulation at Baltimore.

Less request for steamers. Future of shipping a cause for anxiety. Glaring differential between rail delivery and shipment by water. Agencies begin to wonder what steps will be taken for their relief. Possibility of through shipments from B. & O. another factor. Continual trouble with hot storage piles. Anthracite receipts show decided loss. "Free coal" increased to 100 cars daily. Complications over local allotments, prices, and two-thirds rule. Water deliveries disappointing, but improvement expected now that lake shipments have ceased. Market still absorbs broken and pea.

Bituminous—Several of the largest textile mills, as well as shoe factories and other plants for the past year engaged largely in war work, have now been notified to stop deliveries on Government contracts. One mill using 4000 tons per week and employing 5000 hands has already changed from war conditions to something like normal activity. Night work ceased a week ago, and this is typical of a large number of similar industrial units. One result is a heavy decrease of coal consumption and therefore a long extension of the time which must elapse before such interests appear in the open market.

The coal trade is marking time. Aside from a very light volume being sold in the current market, there is practically no new business that can be reported. A new contract for future delivery is a thing unheard of. Present movement is confined to those shippers who are so fortunate as to have outlets where the fuel authorities were unable to stock for months ahead during August and September when bituminous of all kinds was being poured into New England.

All embargoes and restrictions are off, so far as this territory is concerned. In effect, this was all discounted months ago, because storage and other limits had to be disregarded in order to absorb the heavy tonnage that was thrown in this direction. The bituminous department of the New England Fuel Administration is now practically disbanded, except for the adjustment of various complications that arose during the active season. All "Storrow bituminous" has now ceased moving to any of the tidewater loading piers, and it is understood that no further requisitions will be filed for "emergency" coal. Some coal of this description remains at Baltimore and at the New York piers, but doubtless all these miscellaneous tonnages will be worked off during the next few weeks.

Receipts all-rail at the five New England gateways show a greater falling off since Nov. 12 than for any similar period since last winter. From the 13th to the 18th inclusive the average daily movement of commercial bituminous was only 287 cars, a considerable reduction from the 600 cars that was the daily average only 60 days or so ago. Railroad fuel averages were only 80 cars daily, for the same period, and this also is a big reduction in movement.

Receipts by water have decreased about in the same proportion as those by rail. The different shippers have distribution in their own hands now and for that reason the ultimate disposition of cargoes seems to proceed more smoothly. Boston houses are more and more inclined to advise their principals to take what foreign business can be had, the outlook for coastwise business is so dubious for months ahead. This is reflected in current receipts which are very light at practically every forwarding point.

The only loading port where there is any considerable accumulation is Baltimore. It is only natural that in a market such as we now have there is decidedly little request for the lower grade coals from the Fairmont district. The New England Fuel Administration has several cargoes on hand awaiting disposition, but as yet no outlet has appeared. Steamers also are not in good request for coastwise coal service. At a recent meeting of Mr. Storrow's advisory committee of shippers but eight steamers were placed out of a possible twenty. This means that movement to this territory has slackened to an extent almost unexampled at this season.

One of the real problems for coal shippers appears in the very pronounced differential in favor of the all-rail routes. At points within easy access of tidewater there is now a difference in delivered cost of practically \$2 per net ton, even when there is no demurrage on the water coal. This discrepancy is so glaring that the various Hampton Roads agencies are wondering what is to become of their customary business, and what measures are to be taken for their relief. The obvious first move is a reduction in coastwise rates, but not everybody is clear how this can best be managed. The recent publication of new through tariffs from B. & O. territory to

eastern points has given new point to the discussion.

There is continuous difficulty on the part of large steam-users over the heating of coal in storage. Much of this arises from the great anxiety to take on as much coal as possible, but doubtless the chief cause of trouble is in the number of different grades piled together. This condition has an important bearing on the present attitude of buyers toward steam coal now seeking a market.

Anthracite—Domestic sizes received all-rail have shown a decided slump the past week. From the 13th to the 18th, inclusive, the average daily movement was but 316 cars. "Free coal," running to Mr. Storrow's order at the gateways, has been increased from 50 cars daily to 100 cars. Before the order was increased the yield through this channel was about 50 per cent., but the proportion the past week showed an improvement with respect to this emergency coal. It is understood that doubling the original order is to last until the arrears on the first order are made up.

Water deliveries continue to be very disappointing, but now that shipments to the lakes have practically ceased there is hope for improvement in the near future. Stove and chestnut are still in very short supply, and the market continues to absorb large tonnages of broken and pea.

NEW YORK

Anthracite production continues to lag and scarcity of domestic sizes becomes serious. Return of miners from war is only hope, operators believe. Police survey shows that this city lacks over three million tons. Bituminous situation in fairly good shape. Operators slow because of labor shortage and operators have many Government orders. Fairmont coals easy.

Anthracite—The return to the mines of several thousand men who are either now in the country's service or afflicted with influenza and an increase in production would be welcome news to consumers who are short of this winter's coal supply. The demand which eased up considerably because of the continued warm weather has again taken a brace, and householders are becoming urgent. That the situation is not more serious is altogether due to the urgent request of the Fuel Administration and dealers early in the year that every consumer buy his coal early.

Reports from the mining regions received here are not encouraging. They show a steady falling off, due to the inroads of the influenza epidemic, but now the authorities believe they have the situation well in hand. Despite this handicap the operators report the tonnage produced is ahead 128,942 tons for the coal year to date, as compared with the same period of last year. Efforts are to be made by the Federal authorities to increase production, and toward that end it is proposed to release about 7500 mine workers who are now in the service. The new wage scale is now in full working order.

The order of Dr. Garfield fixing maximum prices for the steam coals has not so far resulted in changes in any of the price schedules, nor has it caused any falling off in stocks. Buckwheat No. 1 is plentiful, but the supply does not cause so much trouble to shippers as it did a few weeks ago. The starting of fires in the office buildings has required more of this size. Rice and barley are nearly a drug on the market. Everybody seems to be filled up with these two sizes with no apparent demand.

The domestic sizes continue to be in heavy demand, with stove and chestnut leading. Dealers are now offering consumers egg instead of stove.

While receipts at the local docks for the week show a decrease from what they should be, the dumpings for the seven-day period ended Nov. 22 show an increase of 1344 cars over the previous week, the reports showing 5599 cars dumped as against 4255 cars.

The result of the survey of the coal situation in Greater New York made under the direction of Mayor Hylan shows a deficit of 3,577,261 tons. Much of this shortage may be accounted for by the refusal of dealers and householders to give the police the information sought on the ground that it could be obtained at the office of the local Fuel Administrator.

Current quotations, per gross ton, f.o.b., tidewater, at the lower ports are as follows:

Circular Individual		Circular Individual	
Broken...	\$7.80	Buck...	\$5.10
Egg...	7.70	Rice...	4.65
Stove...	7.95	Barley...	4.15
Chestnut...	8.05	Boiler...	4.60
Pea...	6.55		

Quotations for domestic coals at the upper ports are generally 5c. higher on ac-

count of the difference in freight rates. Prices on buckwheat No. 1 and the smaller sizes of anthracite coal are not fixed by the Government.

Bituminous—The rescinding of the storage regulations is not expected to have any material effect on local market conditions inasmuch as most large consumers—both essential and non-essential industries—are well supplied with coal. With these stocks on hand most consumers are not inclined to do any more buying for the present, but are looking for a change in conditions with a possible change in prices. With this prospect before them they are not going to be found with a lot of high-priced coal in their bins if the market does break.

Commercial coals are in good shape. There is no great amount of free coals here, but this is entirely attributed to the decrease in production as a result of the epidemic and the lack of labor, together with the let-up in demand. Tradesmen returning from the mining fields report that conditions last week in the Clearfield regions showed signs of improvement. Production was in fairly good shape, and although labor was short, the epidemic was said to be improving. Car supply was good and operators had plenty of orders from the Fuel Administration and railroads to take the entire output.

Fairmont district coals were in better shape and plentiful. That district has not been hurt so severely as others, and the labor situation is in better shape than in almost any other mining field. Shippers had no difficulty in taking care of their orders and the demand continues to be good.

Consumption here will not be as heavy as during the past few months. Manufacturers engaged in making war necessities are dismissing their help and eliminating overtime in their factories, reducing operations to an eight-hour basis.

Receipts at this harbor are far below normal conditions but sufficient to take care of immediate requirements. Shipments of Storrow coal to New England water points are low and as in previous weeks, there are many idle bottoms in the harbor. The local dumpings for the seven-day period ended Nov. 22 were 6121 cars, as compared with 5033 cars the previous week, an increase of 1088 cars.

Just now coalmen are considering the outcome of the threatened strike of marine workers set for Dec. 1. Should the strike be called, it will affect about 60,000 men employed in and about the New York harbor and will result in all shipping being tied up.

Bunker coal is in fairly good shape here. More could be handled because of the heavy shipping, but there is no delay in coaling vessels. There is a heavy demand for the high grades from individuals, but as these mostly go into the bunkering pools there is little for outside consumption.

Current quotations, based on Government prices at the mines, net ton f.o.b., tide-water at the lower ports, are as follows:

	Mine Gross	F.o.b. N. Y. Gross
Central Pennsylvania:		
Mine-Run, prepared or slack	\$3.30	\$5.45
Upper Potomac, Cumberland, and Piedmont Fields:		
Run-of-Mine	3.08	5.23
Prepared	3.36	5.51
Slack	2.80	4.95

Quotations at the upper ports are 5c. higher.

PHILADELPHIA

Anthracite shortage of family sizes unrelieved. Production reduced by several causes. Producers and officials consider subject in closed session. Closing of training camps will release family sizes. Water tonnage to be diverted locally. Stove and nut in greatest demand. Pea grows scarcer. Steam coals unchanged. Bituminous situation still quite easy. Demand well met.

Anthracite—Conditions in the city are rapidly reaching a point where some drastic action to increase coal supplies is imperative. In times of stress we are inclined to believe that most dealers exaggerate their wants, but a recent canvass of the representative dealers shows a majority of them in desperate need of the family sizes. The stocks are lower than at any time since April, the beginning of the coal year. Shipments have not increased during the past week, and it is only due to the mild weather that there has not been serious discontent. The loss of tonnage due to the influenza epidemic was a severe blow to all the plans of the distributors. That the production is still below the anticipated figures is claimed by all operators. The peace celebration in the region, followed by several days of half-hearted work, is also

responsible for a great loss of coal. There are some who claim that the recent increase in miners' wages, together with the knowledge that the war is over, has had a tendency to encourage idleness among the men. The one bright feature of the situation is that the government has arranged to release men from the army as soon as possible in order that such as are skilled in work about the mines may at once aid in increasing production.

At the office of one of the large companies it was learned that its shipments by water would be greatly reduced by the 25th inst. and that it was expected to divert a heavy tonnage into eastern Pennsylvania. This company's trade in Philadelphia has been neglected for a month, and it is believed every effort will now be made to care for it. Another company expects to be in the same position by Dec. 1, when its customers confidently expect coal. While Philadelphia dealers are "sore" and feel that this territory has been unduly neglected, they are daily growing more inclined to place the blame on the inexperience of the numerous fuel administrators rather than upon their shippers.

The increase in the retail prices due to the advance in the mines' price is causing a storm of protest, and strange to say the greatest objectors seem to be the consumers with established credit with their dealers. One of the largest suburban dealers this week expressed the determination to deliver his limited receipts to his cash customers only. He claims to be having little trouble with his C. O. D. business, but states that when coal is charged the bill is invariably returned for correction and then a lengthy and unpleasant correspondence follows. The fact that everyone signed coal cards agreeing to pay the prices in effect at time of delivery seems to have been overlooked by most of the consumers. The complaints to the fuel administration became so numerous that they were unable to handle them and this week they inserted an extensive notice in the city dailies calling the attention of the public to the facts underlying the increase in retail prices. In this it was plainly stated that the retail coal dealers' profits are not a fraction of a cent greater than they were last April, despite the increased cost of delivery.

As to the different sizes, egg remains easier than stove and chestnut, but only because there is less of it burned here and a larger proportion of it has been delivered to the consumers. Stove and chestnut are equally scarce now, with many yards without a ton of either. Pea is not in the same active demand, due to the continuance of mild weather. This is the size for which the first cold snap will bring hurry calls to every dealer from the smaller homes. Even now the stocks of it are low, with every dealer anxious for a supply before real cold weather arrives. There is not the slightest increased retail demand for buckwheat coal and the dealers do not anticipate much demand for it unless conditions become critical in the next six or eight weeks.

In the steam coals No. 1 buckwheat is somewhat easy, but the tonnage is all taken without much trouble. Rice is doing fairly well, principally due to the heavy tonnage of this size being delivered on contracts. The spot market for it has very little activity. About as much can be said for barley, while culm is out of the market.

The prices per gross ton c.o.d. cars at mines for line shipment and f.o.b. Port Richmond for tide are as follows:

Line	Tide	Line	Tide
Broken	\$4.90 \$6.25	Buckwheat	\$3.40 \$4.45
Egg	4.80 6.15	Rice	2.90 3.80
Stove	5.05 6.40	Boiler	2.70 3.70
Nut	5.15 6.50	Barley	2.40 3.30
Pea	3.75 5.00	Culm	1.25 2.15

Bituminous—The soft coal situation still continues easy, there being more than sufficient coal to meet every demand. While this is causing some uneasiness to shippers, yet it is generally agreed by all that it is better this way than the reverse. The bituminous producers started out to supply the industries of the country with fuel and present conditions are evidence that they have accomplished their purpose.

So far as we can learn, the government price is being maintained, although with the continuance of open weather for many more weeks there is no telling what might happen. There are plenty of rumors already that occasional shipments have been sold at a price as low as \$3, but certainly no one is quoting such a price and it must have been made to move coal for special reasons. There is beginning to be quite a little solicitation for orders by some houses, both directly and by letter. This is usually on coals that in ordinary times have trouble to make the market at the full price.

BALTIMORE

An easy soft coal supply and a line of inquiries starting from the mines under new conditions. Bituminous will be available for domestic use if hard-coal scarcity continues.

Bituminous—The entire soft coal market here is easy, although for a brief time last week there was a shortage in the very best grades held for Government account, due to the fact that the Pennsylvania R. R. took over large quantities of coal that had arrived at some pools for other purposes. With a release of the industrial world by the fuel administration from all storage restrictions, a number of smaller industries are now putting away coal that is coming freely into the market. Reports with the local fuel administration show most of the large industries pretty well stocked, and some have two to four months of coal ahead. Many old connections between mines and middlemen and customers are being reestablished or preparations made for resumption as additional Government contracts are cancelled, thus releasing preferentially held production.

The district representative during the week, on order of the national fuel administration, notified all box-car loaders that no more such coal would be applied to the accounts of state fuel administrators. This sent a flood of notices from such producers to the general trade, the offerings being at the Government price, plus 75c. Middlemen here report that they are now getting all the coal they need at the moment from regular old connections, and that inquiries they have made to mines still tied up on Government coal or Government-directed coal are answered by letters promising fuel a little later. The result is that purchasing agents here are no longer asking the fuel administration for any diversions. It may be said for the first time in months that the soft coal situation here is without snap.

Anthracite—A decided scarcity of hard coal exists here despite the rosy statements of the fuel administration nationally. The receipts in October of 45,406 tons proved a tremendous disappointment, as about twice that amount had been hoped for. Stove size is almost out of the market, many dealers offering only No. 2 (egg) or pea coal, which is unfitted for many homes. In connection with the fact that many homes here are entirely without fuel, Jere H. Wheelwright, as head of the National Coal Association, comes out with a statement that there will be no need for anyone freezing. With the war demand cut off, he points out that high-grade soft coal can be diverted to domestic use when anthracite is not to be obtained.

Lake Markets

PITTSBURGH

Greatly decreased production brings about order shutting off supplies from many consumers. Stocks will tide over. Market firm.

The Pittsburgh coal market began to show a slight softening tendency upon the signing of the armistice. Good grades of coal remained very firm, but as had been the case with certain Ohio districts for several months, the poorer grades began to show a weakening. This tendency has not proceeded, as something like a shortage appears actually to have developed, due to the sharp and continued curtailment in output caused by the influenza epidemic. Conditions became such, at any rate, that last Thursday night the Federal Fuel Administration instructed R. W. Gardiner, distributor for the Pittsburgh district, to shut off supplies of coal, with certain exceptions, from all consumers in the immediate territory bounded on the west by the Ohio River, on the south by the Pennsylvania state line, on the east, roughly, by the eastern edge of the Pittsburgh seam and on the north by the Allegheny county line. The exceptions are railroads, gas-producing plants, byproduct coking plants and retail dealers. Mr. Gardiner is given discretion as to other consumers who may be in great need of coal, such as public utility companies. In essence, this is an order requiring consumers who have stocks of coal to draw upon them until the emergency is past. The decrease in production indicated by this measure is clear when it is considered that lake shipments have ceased, although they had been running at 350,000 tons a week from the district for a long time, and at fully 300,000 tons a week late in the shipping season. It is estimated, roughly, that the influenza epidemic, reinforced by the disposition of

workmen to celebrate the cessation of hostilities, has brought the district's output down.

Prospects are that as soon as normal production conditions are restored most of the wagon-loading mines will go out of operation, as well as some others that do not produce really good coal. For standard grades of Pittsburgh coal it is expected there will be a market at the full government limits for some time, and the market is now quotable on that basis: Slack, \$2.10; mine-run, \$2.35; screened, \$2.60 per net ton at mine, Pittsburgh district.

Many of the foreign-born workmen have determined to go to their native lands, although fewer will go than now express the intention. One coke operator reports a census taken of his workmen as follows: Twenty-five per cent. stated they would remain at work; 25 per cent. intended to make brief journeys abroad; 50 per cent. stated they were going back to stay.

The market remains quotable firm at the set limits: Furnace, \$6; foundry, 72-hour selected, \$7; crushed, over 3-in., \$7.30; clean screenings, over 3-in., \$5.50, per net ton at ovens.

The "Courier" reports coke production in the Connellsville and Lower Connellsville region in the week ended Nov. 16 at 259,930 tons, a decrease of 19,720 tons, and raw coal shipped at 185,240 tons, a decrease of 8597 tons. The heaviest coke production since the first of the year was 353,470 tons, in the week ended July 13, the average in September being a trifle over 340,000 tons a week.

TORONTO

Little anthracite coming forward. Dealers refusing new orders. Prices advanced. Market overstocked with bituminous and dealers trying to unload.

Very little anthracite is being received, owing to the large shipments which are being forwarded to the upper lakes before the close of navigation. Most of the dealers are again refusing new orders and endeavoring to overtake delayed deliveries. Consumers who were reported as being entirely destitute of fuel have all been supplied with small quantities, and owing to the unusual mildness of the weather, the shortage has not been so severely felt. The market is at present overstocked with bituminous, which is not much in demand, and some dealers are shading the government prices in order to effect sales. The price of anthracite has advanced following the increased cost at the mines. Quotations for best grades per short ton are as follows: Retail anthracite egg, stove, nut and grate, \$12; pea, \$11; buckwheat, \$9; bituminous steam, \$9.25; slack, \$8.25; domestic lump, \$11; cannel, \$13; wholesale f. o. b. cars at destination, three-quarter lump, \$6.50 to \$7; slack, \$5.50 to \$5.82.

BUFFALO

Bituminous in good supply. Jobbers becoming more active. Some unsold coal on track. Miners getting back to work. Anthracite demanded.

Bituminous—The supply increases and the demand does not, so a surplus is in sight that may become large before long. The producer and jobber fear it and are trying to avoid it. Producers are again saying that they will shut down before they will allow prices to go below the profit line. Jobbers, of course, are anxious for enough surplus to give them business, but to maintain merely a working surplus of that sort is by no means an easy matter.

This condition of the trade means that the jobbers are going back into something of their old activity. They do not get any great amount to do yet because the consumers are holding off. The idea is that prices will decline, and as the consumers have more coal on hand than they have had in a long time it is not to be expected that the demand will run very high right away. The actual consumption is going to be large, but with the weekly production of late running well above 2,000,000 tons a week over last year a surplus can hardly be avoided.

There is talk of prices running below the regulation figures, but it is not yet reported that any really good coal has been offered at a cut, and the situation is hardly such as to warrant it right away. But for the big slowing up of mining on the outbreak of the influenza the surplus would have been large now. Then there comes a further surplus from the shutting off of the shipments to the lakes, which alone is enough to create an over supply. So the future supply is seen to be heavy in spite of all influences to the contrary.

Anthracite—The supply does not increase much, but on the whole the feeling is easier, for many people are saying that the supply will increase soon, much in the way bituminous has done. The fuel authorities

still say that the allotment will be filled according to plan, and that when the people stop demanding more coal than they need it will be easy to keep ahead of the actual needs.

There is much disposition to complain of the advance in price, which brings the retail cost of chestnut to \$10.50 per net ton to the curb, with 50c. more for putting in, a price that would be granted without much of a murmur if it could be made to appear warranted by any new conditions arising.

The shipments by lake continue large and will go on for a week or so longer, after which they will soon drop off. The amount for the week was 156,200 net tons, of which 79,700 tons cleared for Duluth and Superior, 17,400 tons for Fort William, 17,000 tons for Sheboygan, 16,000 tons for Milwaukee, 15,500 tons for Chicago, 6000 tons for Green Bay, 2800 tons for Hancock, 1000 tons for Depere and 800 tons for St. Ignace. This is the heaviest weekly amount this season.

CLEVELAND

Standard No. 8 coal is just able to hold its own in this market, with the result that No. 6 and stripping coal have sagged as much as \$1. The tendency is all toward weakness, many operators believing the bottom will be touched between now and Jan. 1. Contract cancellation, especially by retail dealers, has assumed proportions. Production has receded, due to recurrence of influenza.

Bituminous—Decided weakness among the lower grades, which is reported to be making breaches in the better grades, is apparent on every side. Demand has narrowed until it now is just about flush with the production of Standard No. 8 coal. Consequently, concessions for other grades are sought and obtained. Coshocton slack—a No. 6 coal—has been offered at \$2.40, or 25c. below the Government maximum. Top prices on bituminous from stripping operations in eastern and southern Ohio have been shaded as much as \$1 in tonnage. Several big operators foresee the weakness spreading to the standard grades and are prepared to make cuts. Federal Fuel Administration officials here, and many big operators declare flatly that so far no shading has been required for standard No. 8 coal, but they will not go on record as to how long this condition can continue. Operators assert there is no cause for pessimism now, with coal selling at the highest prices on record, but there is no escaping the facts that every indication discernible is one of weakness.

Readjustment of industries in the lower lake regions is well under way. Labor already has suffered a deep cut in wages through elimination of Sunday and overtime work. The much-talked-of reconstruction business so far has not developed, primarily because work will not be undertaken so long as prices, on the average, are twice as high as normal. Cessation of munitions making has thrown as high as 6000 workmen out of 7000 in one lower lake plant out of employment. Efforts of Washington to maintain commodity prices or wages by artificial means are doomed to failure, it is believed.

Industrials, operators point out, on the whole have large stocks which they will seek to work off. Thus, they will be out of the market for the present. But by the time peace requirements do come out in volume the industrials again will become coal buyers. This is the logic behind the claims of some operators that the low point in the coal market should be reached between now and Jan. 1, with a gradual pick-up coming with the new year.

Were it not for decreased production at the mines, bituminous plainly would be a glut on the market. Stocking restrictions have been entirely wiped out. The lightless-night ban has been modified and is effective now only two, instead of four, nights a week here. Three carloads of mine-run, offered at public sale by the clerk of the municipal court to satisfy a judgment, brought only \$1.20 a ton. The lake trade has slowed up to the point where it is a small factor. Cancellations of contracts by retail dealers on account of no market have become numerous. Retail dealers stand together, apparently, in the belief that reduction of prices will not stimulate business, for retail prices have not been cut in the face of a dropping off of fully 50 per cent. of retail business. Influenza has returned, in spots, to the No. 8 district, and coupled with the opening of the hunting season and the general letting down caused by the signing of the armistice, production has suffered greatly. Operators, however, welcome this state of affairs just now. Car supply, too, has fallen, but this occasions no concern.

Shipments in the week ended Nov. 7 by operators who are members of the Pittsburgh Vein Operators' Association of Ohio

totalled 4475 cars, compared with 8069 cars in the week ended Oct. 31 and 4882 cars in the week ended Oct. 21. Car supply reported by these same operators in the week ended Nov. 9 averaged 21.54 per cent. short, as against an average shortage of 26.27 per cent. the first week preceding and 30.47 the second.

Anthracite—Belief that more anthracite and Pocahontas would come in, with the demand at tidewater lessened, has been dispelled, and retail dealers believe receipts will become no heavier until after Jan. 1. The 1918 schedule will be continued, they understand, which means that the movement into Cleveland will hover around the 25 to 30-car a week point.

Lake Trade—The movement of bituminous to Lake Erie docks for the Northwest has fallen to the lowest point of the season to date, but the 2,388,875 tons required to round out the 28,000,000-ton allotment for the Northwest will be floated by the end of the month beyond doubt. Requests for use of equipment at both lower and upper lake docks after Nov. 23, the official closing of the lake coal season, have been few. Anthracite, undoubtedly, will be floated so long as the carriers are operated. The loading of bituminous at lower lake docks in the first half of November is estimated at 1,650,000 tons by the Coal and Ore Exchange, of Cleveland.

DETROIT

Diminished activity in the domestic and steam plant trade in bituminous is ascribed to an over-supply in the hands of buyers. Anthracite stocks are low.

Bituminous—Reserves in the hands of consumers of steam coal and in the yards of retail dealers have produced an inactive market for bituminous in Detroit. Jobbers say they meet with little success in the attempt to arouse interest in new commitments, even when the coal offered is of a quality superior to that of the stock which has recently been available.

In following the advice of the fuel administration to stock up early and take any coal obtainable, the users of steam coal and the retailers have been induced to load up rather heavily with the coal sent into the local market from Indiana and Illinois. This stock is described by jobbers as of inferior quality and is said to be causing annoyance to the industrial plants attempting to use it, as well as to the retailers, who are endeavoring to distribute it among reluctant household consumers.

The domestic demand is blunted by the weather conditions, which have not yet taken on sufficient suggestion of winter frost to stimulate buying by householders. Quite a number of the domestic consumers are also reported to be holding back in the hope of being able later to stock up with anthracite. Asserting stocks now on hand would be exhausted in a week of real winter temperature, W. K. Prudden, Michigan fuel administrator, is preparing to open two coal yards in Detroit, with the intention of storing there shipments of bituminous, which local consignees refuse to accept.

Anthracite—Demand for anthracite from domestic consumers continues strong. Applications from consumers unable to obtain supplies from dealers are being received at the rate of about 40 daily in the offices of the fuel administration, though more than 65,000 such orders were booked early in September. Of the latter, it is said practically all have been provided with a maximum of two tons, while a further distribution is planned, in case the coal is forthcoming. Receipts during the present month are falling short of the shipments in October.

Lake Trade—Practically all coal for the head of the lakes had been loaded before midnight, Nov. 23, though a few shippers who had fallen behind are sending forward additional cargoes this week, where boats are available. The demands of the grain trade for ship storage capacity have left few freighters to be had for moving coal.

COLUMBUS

Weakness in mine-run and screenings still continues. There is a good demand for domestic sizes although domestic trade is quiet because of continued warm weather. The lake trade is practically over. The tone of the market is not as good as formerly.

The principal feature of the coal trade in Ohio is the continued weakness in steam sizes. An over-production of mine-run in every field is reported and markets are flooded. This is especially true of many small mines in the Hocking Valley field, which have been opened under the stimulus of war business. Screens were not obtainable and mine-run was the only grade marketed. Another reason for the larger amount on the market is the fact that

steam users have heavier stocks of fuel in reserve than ever before. It is believed that reserve stocks average about two months and possibly more. Steam consumers have stopped buying as they are desirous of using their surplus stocks. Railroads are not taking as large a tonnage as formerly as freight movement has decreased. Michigan has been supplied by Indiana and Illinois and that section will not be in the market for some time.

Domestic trade still shows strength despite the unfavorable weather conditions. Dealers' stocks are pretty large, but there is still a good demand for prepared sizes. West Virginia grades are especially sought after. Dealers will not buy any more mine-run as they have their bins clogged. It is believed that the rural sections are the best prospects for business as farmers have been too busy to haul their fuel. City consumers have about 75 per cent. of their supply, while rural people have but 35 to 40 per cent. Dealers in the smaller towns are as a result the best customers. Retail prices are still firm at former levels.

Lake trade is now about over as only a few cargoes will move after Nov. 23. The lake season as a whole was successful and all Northwest requisitions were filled. There will be no shortage of fuel in that section. Vessel movement was much more efficient than ever and less time was lost in loading and unloading. Ohio and West Virginia furnished a large part of the coal shipped to the upper lake regions.

Production has fallen to about 50 per cent. of normal, mostly because of the influenza and peace celebration. Then the opening of the hunting season was another cause for loss of tonnage. Some few mines have been closed because of lack of orders. It is believed that eastern Ohio is producing a larger amount than any other section.

CINCINNATI

Mild weather and lack of industrial buying have produced a dull market, so that small shipments are ample to meet demand.

The effect on manufacturing of the sudden, if not unexpected, coming of peace, has been marked, in this section, especially, where so many large industrial units have been extensively engaged in the production of commodities for the use of the Government and the Allied powers for war purposes. In a good many cases these factories have already been notified that a greatly diminished activity for Government purposes will be immediately put in effect, and in other instances instructions to cease operations on contracts have been received.

A striking local instance of the manner in which industrial war work is affected is the cessation of work on the enormous air nitrates plant near Cincinnati, which was to use electric current from the local station of the Union Gas and Electric Co. This plant will not be completed, at least for Government use, and the current, and hence the coal to produce the current, will not be required.

With little need as yet for coal for heating purposes, and with the industrial market for steam fuel in the condition indicated, the entire market is extremely quiet; and as far as the steam market is concerned, it is somewhat difficult to say just when conditions will return to normal.

In many lines, particularly in machinery, it is not expected that there will be any period of actual dullness, the present caution being purely for the purpose of awaiting developments. In the mining sections some trouble from influenza is still reported, tending to reduce production, and transportation conditions are also suffering from the same handicap; but shipments are adequate, in view of the reduced demand.

LOUISVILLE

General market draggy on all lines, both domestic and steam being quiet. Lake region shipments over, and Southeastern coal now moving to retailers of Kentucky and South.

Mild weather is not helping things much in Kentucky just now, and the retailer, jobber and producer are all in the same boat—short of business, and doing everything possible to secure a market for coal. It is claimed that about 80 per cent. of the big domestic demand has been supplied for the winter, and that only cold weather will make the remaining percentage buy.

Industrial consumers are using up coal stocks on hand, feeling that the market may go lower, and that they will have no difficulty in securing coal whenever they require it, with the result that they are playing safe on uncertain business.

Receivers are becoming finicky concerning grades at the present time, and are turning down shipments on the claim that the grades are not as represented, this resulting in some coal paying demurrage on track.

For the first time in months a good sup-

ply of eastern and southeastern lump coal is coming on the market. However, many retailers are well stocked on Hazard and western Kentucky lump and are accepting little additional coal, having all they want for the present. However, retailers out in the state that were not able to secure western Kentucky, Hazard or eastern Kentucky, which latter was moving to the lakes for months, are now just beginning to get some stocks laid up in advance of cold weather.

A shipment of nine barges of Pittsburgh coal which came down the Ohio River a few days ago represented the first received in eight months. Eight barges went to New Albany, Ind., one barge of lump being delivered at Louisville. The E. T. Slider Co. and the River Coal Supply Co. had the entire shipment, which consisted of six barges of lump, two of slack and one of mine-run.

At the present time there isn't much demand for eastern Kentucky coal, West Virginia or Pittsburgh on the local market, as there is not a ready demand, and the price is so strong that it takes too much money to stock a yard on such grades. Retailers in many instances have a month to six weeks supply on hand and are not unloading any additional coal until they reduce stocks.

Continual reports are being heard concerning producers and jobbers cutting prices 15c. a ton and more in order to get business. Some mines with no more than a day or two of business ahead of them are willing to accept almost any price to get business, and the value of a good sales manager is again demonstrating itself.

BIRMINGHAM

Railroads short of coal. Domestic demand strong. Operating conditions show a little improvement.

While the local coal market is not specially strong for the steam grades, the requirements of the trade are now greater than the supply coming from the mines, due to the fact that the railroads have been taking the maximum obtainable under their contracts, during the past few weeks, thus interfering with regular shipments to other classes of consumers, who are now beginning to run low on stocks. Railroads securing fuel in this zone are reported to be very short and are exerting efforts to expedite heavier movements of coal from the mines. An increase in the tonnage of bunker coal required from this district is expected about the first of the year or sooner, as more shipping is expected to be diverted to the Gulf ports in the near future.

The domestic trade is without change, there still existing a strong demand, which is much in excess of the supply available, and some steam coal is being prepared and diverted to domestic channels.

Coal production appears to be picking up a little this week with the return of more miners to their tasks. Operating conditions were very unsatisfactory during the past week, the peace celebration completely disconcerting the regular routine, and mine workers were slow to return to their labors, and the output, which had been so seriously crippled by the influenza epidemic for several weeks, showed little improvement. The production for the week ending Nov. 9 was 348,306 net tons.

Coke

CONNELLSVILLE

Further decrease in coke production and raw coal shipments. Market quite firm. Labor migration in prospect.

Nothing could have done more to support the market from the shock of the cessation of hostilities than the continuance of declining production of coke. Week by week the influenza epidemic has reduced output, while week before last the celebration of the termination of hostilities made further inroads on production, and a payday at the close of the week paved the way for a continuance of the celebration last week. Consumption of coke is at the former rate, there being no disposition on the part of blast furnaces to slow down or blow out, even for repairs that in several cases will have to be made within no great length of time.

Generally speaking the hope of coke producers is that the market will stay up to the government limit of \$6, while the expressed expectation of consumers is that there will soon be a drop, and one of no small proportions. The Fuel Administration's maximum price does not seem to have a definite time limit, and as the administration's control is permitted to the declaration of peace, the control will only be taken off by definite action of the Fuel Administration, and this is not likely to occur. The blast furnace and steel interests have shown such cooperative spirit in the past that they have some expectations of

adhering to government maximum price for pig iron and steel as long as they are maintained, but the coke producers are hardly in the same category; and it is possible that if shading of government limits began it would soon run to important proportions.

Until production is restored to something like normal there can be no question as to prices. Consumers have always felt that the \$6 coke price was rather high, even as compared with \$2.35 for Pittsburgh district coal, which they do not consider a low price by any means. The coke trade is short of labor, or the influenza epidemic would not have had such a remarkable effect in decreasing production, and the present outlook is for decreased supply in some respects.

Buffalo—The demand is good, but the supply is now sufficient to meet it, all the furnaces here getting what they want, most of it coming from their own byproduct ovens. Fuel coke still sells pretty well, though it partakes something of the weakness of bituminous coal. It is now quite out of the question to find sale for the coke culm piles which were opened a few weeks ago and thrown on the market. Iron ore receipts are now dropping off materially, as the season is practically at an end. The amount reported by lake during the week was 197,100 gross tons, scarcely more than half the former movement.

Middle Western

GENERAL REVIEW

Middle West market continues weak. Poor grade coal selling below Government maximum. Guiding hand needed to keep market from falling to pieces.

The coal market in the Middle West continues to be very weak. There is one noticeable fact, however, and that is that the high-grade coals, from both Illinois and Indiana, are selling at the full Government prices, and for the present at least, not showing any signs of weakening. The poorer grade coals, however, have been offered very freely of late at considerable discounts from the Government price, and in a great many cases even this discount has been of slight inducement to the average purchasing agent.

The state of Michigan has all the coal on hand that it can comfortably assimilate, and not only are Illinois and Indiana coals allowed to go to all points in the Southern Peninsula, but coal from Ohio, West Virginia and the two eastern districts of Kentucky can now move to Michigan, and are being readily purchased, with the natural result that the poorer grade coals from Illinois and Indiana are being practically shut out.

The State of Illinois has been unable to take care of the coal produced within its own borders, nor has Iowa or Wisconsin been able to absorb its surplus. Indiana coal today is consumed practically within its own borders. This is because to date eastern coal is not allowed to move to points in Indiana, and Illinois coal cannot compete in most cases, with Indiana coal, when the low freight rate of the Indiana product is brought into consideration.

There are a great many opposite views relative to the immediate future of the coal industry. It is freely said that unless the Government steps in and controls the basic industries, by establishing a minimum price, as well as a maximum price, that the coal industry will suffer a tremendous loss. This is because the producing mines must be kept running, and in order to keep their labor organizations together, the operators, nine times out of ten, are willing to make very substantial reductions in order to move their product and keep their organization intact.

The optimists of the coal industry believe that conditions will soon change, and that the renewed activity along manufacturing lines will be able to absorb the coal produced by this country. One example quoted was a large factory, which, before the war, was engaged in the manufacture of veneer work, used in building. When this country entered the war, the manufacture of building material was curtailed, but most of the manufacturers received Government contracts to keep them running for the time being. The firm we have in mind at once engaged in the manufacture of propellers for aeroplanes. In the meantime, all the surplus veneer stock they had in their storerooms was sold, and they accumulated a very large number of orders to be filled after the war. A few days after the armistice was signed, these people had their propeller contract canceled, and their plant is now down, but within a very short time will reopen, and all their activities will be concentrated on producing veneer work.

The Middle West has been enjoying a long period of mild weather, and as a result but little coal has been consumed. The market will be helped by the coming of cold weather. Furthermore, a number of larger industries which purchased coal during the season and stored it are now consuming it beneath their boilers as fast as possible, and it is fair to assume that they will be in the market again within six weeks.

What the situation lacks at this time, more than anything else, is a strong guiding hand to keep timorous operators from losing their heads altogether, and cutting each other's prices down to a point where the cost of production will not be covered.

CHICAGO

Little activity is shown in market conditions. Cold weather expected to help dealers. High-grade coal bringing full Government prices.

There is little activity in the coal market of this city. The large consumers are out of the market and will be out of the market for some time to come, as they are doing all possible toward reducing their substantial storage piles. There is practically no demand for coal in Chicago. The only people who are purchasing coal at this time are doing so to take advantage of reduction in price made them by some producer or jobber.

The domestic situation continues to be extremely dull on account of the mild weather. It may be confidently looked forward to that as soon as a cold snap comes there will be a revival of activities in the domestic trade. Practically the only domestic coals that are holding up to the full Government price are the high-grade and specially prepared products from the southern part of Illinois and from the Clinton district of Indiana.

MILWAUKEE

Shortage in anthracite making it unpleasant for dealers. Illinois coal being pressed upon the market. Lake receipts slowing up as the season of navigation nears an end.

The main feature of the coal situation at Milwaukee at present is a shortage of anthracite. Colder weather finds many consumers waiting for supplies ordered months ago, and naturally the disappointed ones are appealing to other sources for relief. State Fuel Administrator Fitzgerald calls attention to the fact that no dealer has been accorded more than 50 per cent. of the amount sold in 1916, and that while there are cases where dealers have not as yet drawn their full allotment, it does not signify that they are in position to take on any new orders. He advises everybody to stick to their regular sources of supply.

There are huge piles of bituminous coal on the docks and consumers of this character of coal have little to fear. In addition, Illinois operators are unusually active in pressing their products on the market. There has been no cutting of prices of Illinois coal as yet, but this may follow. This condition is directly the opposite to that which prevailed a year ago, when anything having the semblance of coal was eagerly absorbed. Illinois coal is being freely advertised at prices ranging from \$7 to \$7.75 per ton, with an extra charge of 50c. for delivery into bins. Nearly all coal docks are experiencing fires in soft coal piles, but thus far no serious loss has resulted therefrom.

Lake receipts are slowing up to a noticeable extent. Many of the coal-carrying craft are now taking down grain to Buffalo to be held in the vessel until spring. This reduces the tonnage available for coal for the remainder of the season. Receipts during the month of November, thus far, aggregate 87,077 tons of hard coal and 162,568 tons of bituminous. This brings the cargo receipts by lake since the opening of navigation up to 647,046 tons of hard and 3,313,697 tons of soft coal. Anthracite is still coming by rail in fairly liberal quantities.

ST. LOUIS

Slightly colder weather has not improved market, which is continually slipping. Steam and domestic demand light. Prospects poor. Mines idle, with equipment plentiful and transportation good.

The local situation is a depressing one. With slightly colder weather on the 21st, and the first sign of snow of the season on the 22d, the market is in a demoralized condition as regards Standard coal. Standard 2-in. lump went as low as \$1.75 and screenings down to \$1.40, with 6-in. lump going as low as \$2. Even at these prices the mines were obliged to shut down on account of no business. Some mines have only worked one day in the six, and even then had a hard time placing tonnage.

Steam business has dropped off on account of the large plants using up their storage coal, and the munition plants using up what they had in sight, not knowing

how much longer they would be allowed to continue. Offsetting this there should be some business from the brick, tile and cement plants and other industries that have been running on short time as non-essentials, but if there is anything like this in sight it has not materialized to any extent as yet.

Car supply in the Standard field is more than any mine can begin to take care of and transportation is good. Labor is plentiful, and the only thing that worries the operator at this time is finding a market for his coal.

In the Mt. Olive district an effort has been made on the part of the operators to keep out of the sea of despondency, and they have pretty well succeeded on account of their railroad business. There has, however, been a good tonnage of domestic coal moving to the north from this district and the prices are holding up remarkably well.

Referring to railroad coal brings out the fact that many mines in the Standard field that had railroad contracts are idle, and while there is no evidence on hand to prove that the railroads are buying on the open market at lower prices, yet their failure to take the contract coal has greatly depressed the market. The mines that are getting railroad business are the only ones in the field that are working anywhere near regular time.

In the Cartersville and Duquoin field a large tonnage is moving on railroad orders, but there is a surplus at the present time in all of these fields of lump, egg and nut coal, and some mines are finding it hard to move their product, having unbilled coal at the mines daily. This is in both Williamson and Franklin County. The car supply here is plentiful and there seems to be nothing to worry the operator here, other than a place to put his product.

The Government maximum price here, with the exceptions above noted, is:

	Williamson and Franklin County	Mt. Olive and Staunton	Standard
6-in. lump...	\$2.55@2.75	\$2.55@2.75	\$2.40@2.70
3x6-in. egg...	2.55@2.75	2.55@2.75	2.40@2.70
2x3-in. nut...	2.55@2.75	2.55@2.75	2.40@2.70

Washed:			
No. 1.....	3.05@3.20	3.05@3.20
No. 2.....	3.05@3.20	3.05@3.20
No. 3.....	3.05@3.20	3.05@3.20
Mine Run...	2.35@2.50	2.35@2.50	2.20@2.30
Screenings...	2.17@2.32	2.17@2.32	1.50@1.60

Special preparation on Cartersville 10 cents extra. Williamson & Franklin Co. rate is \$1.10. Other fields 95 cents.

The prices in the Cartersville and Duquoin fields have not been cut to any extent. In a few isolated cases the operators have given certain jobbing interests 15c. off of the \$2.55 Government price, so that the top of the market in this district is \$2.55.

There are some operators with special

	October, 1918	October, 1917
P. & W. R. R.....	1,115,340	1,425,265
L. V. R. R.....	1,216,391	1,314,896
C. R. R. of N. J.....	601,180	604,295
D. L. & W. R. R.....	982,966	1,153,661
D. & H. Co.....	739,495	813,429
Penna. R. R.....	393,885	430,662
Erie R. R.....	731,694	793,226
N. Y. O. & W. R. R.....	165,205	179,403
L. & N. E. R. R.....	340,210	396,113
Total	6,286,366	7,110,950

permits of 10c. a ton for extra preparation, but there is an effort being made to have this done away with very shortly.

There is still a heavy percentage of the men missing from the mines on account of the influenza, but it is growing smaller gradually.

The cut mine prices have not, however, affected the retail prices in St. Louis as yet. The Standard price of \$5.45 has been cut by one or two dealers to \$5 and the Cartersville price of \$6.20 delivered has been cut to \$6, but this is not general nor is it likely to be.

Assistant Fuel Administrator John C. Hall has conducted several hearings the past week or two in connection with dirty coal shipped by southern Illinois coal companies to points in the State of Missouri. Mr. Hall is also director of enforcements, and an active campaign is going to be made from now on against all violations of dirty coal, etc.

General Statistics

NORFOLK & WESTERN

Below is given a statement of the coal tonnage from mines on the Norfolk & Western R. R. and from other railroads, for the month of September, 1918:

From	Net Tons
Pocahontas field	1,373,366
Tug River district	283,232
Thacker district	244,785
Kenova district	101,536
Clinch Valley district	160,423
Other N. & W. fields	13,214

Total N. & W. fields	2,176,556
Williamson & Pond Creek R. R. ..	196,433
Tug River & Kentucky R. R.	63,665
All other railroads	72,505

Grand total

2,509,159

OCTOBER ANTHRACITE SHIPMENTS

Shipments of anthracite for the month of October, as furnished to the Anthracite Bureau of Information, amounted to 6,286,366 tons as compared with 7,110,950 tons for October last year, and 6,234,395 tons for the month of September this year, showing a decrease as compared with October of last year of 824,584 tons, and an increase as compared with September of this year of 51,971 tons.

The average daily shipments in October of this year were 232,828 tons against 263,368 tons for the corresponding month last year, a decrease of 30,540 tons in the daily production for the month. This decrease can be attributed to the recent epidemic of influenza which passed over the region and resulted not only in the loss of a great deal of time, but a loss of life in a great many instances. When everything is considered the output for the month of October is commendable and a credit to the anthracite industry.

The shipments by companies were as follows:

	October, 1917	Coal Year, 1918	Coal Year, 1917
P. & W. R. R.....	1,425,265	9,111,369	8,988,139
L. V. R. R.....	1,314,896	8,910,548	8,685,842
C. R. R. of N. J.....	604,295	4,175,925	4,141,140
D. L. & W. R. R.....	1,153,661	7,054,540	7,368,299
D. & H. Co.....	813,429	5,514,544	5,284,571
Penna. R. R.....	430,662	3,260,441	3,300,307
Erie R. R.....	793,226	5,319,347	5,349,365
N. Y. O. & W. R. R.....	179,403	1,210,231	1,197,413
L. & N. E. R. R.....	396,113	2,352,812	2,465,739
Total	7,110,950	46,909,757	46,780,815

CHESAPEAKE & OHIO

Following is a comparative statement of the coal and coke traffic from the New River and Kentucky districts for the month of July, 1918, and the seven months ending July 31, 1918:

		COAL			
		July		Seven Months	
To		1918	1917	1918	1917
Tidewater (bituminous)	554,591	430,710	3,491,488	3,444,117	
East (bituminous)	309,537	197,141	1,932,455	1,667,393	
West (bituminous)	1,479,602	1,484,529	9,131,358	8,684,988	
Company's fuel (bituminous)	152,263	192,772	1,289,316	1,337,297	
From connections (bituminous)	154,112	147,735	955,778	1,064,947	
Total	2,650,105	2,452,887	16,830,395	16,198,742	
Anthracite	282	538	9,021	4,030	
Total coal movement	2,650,387	2,453,425	16,809,416	16,202,772	
		COKE			
		July		Seven Months	
To		1918	1917	1918	1917
Tidewater	14,434	8,422	139,640	82,234	69
East	20,897	20,398	116,272	163,938	
West	35,331	28,820	255,912	246,241	
From connections	6,259	5,367	42,375	46,338	
Total coke movement	41,590	34,187	298,287	292,579	